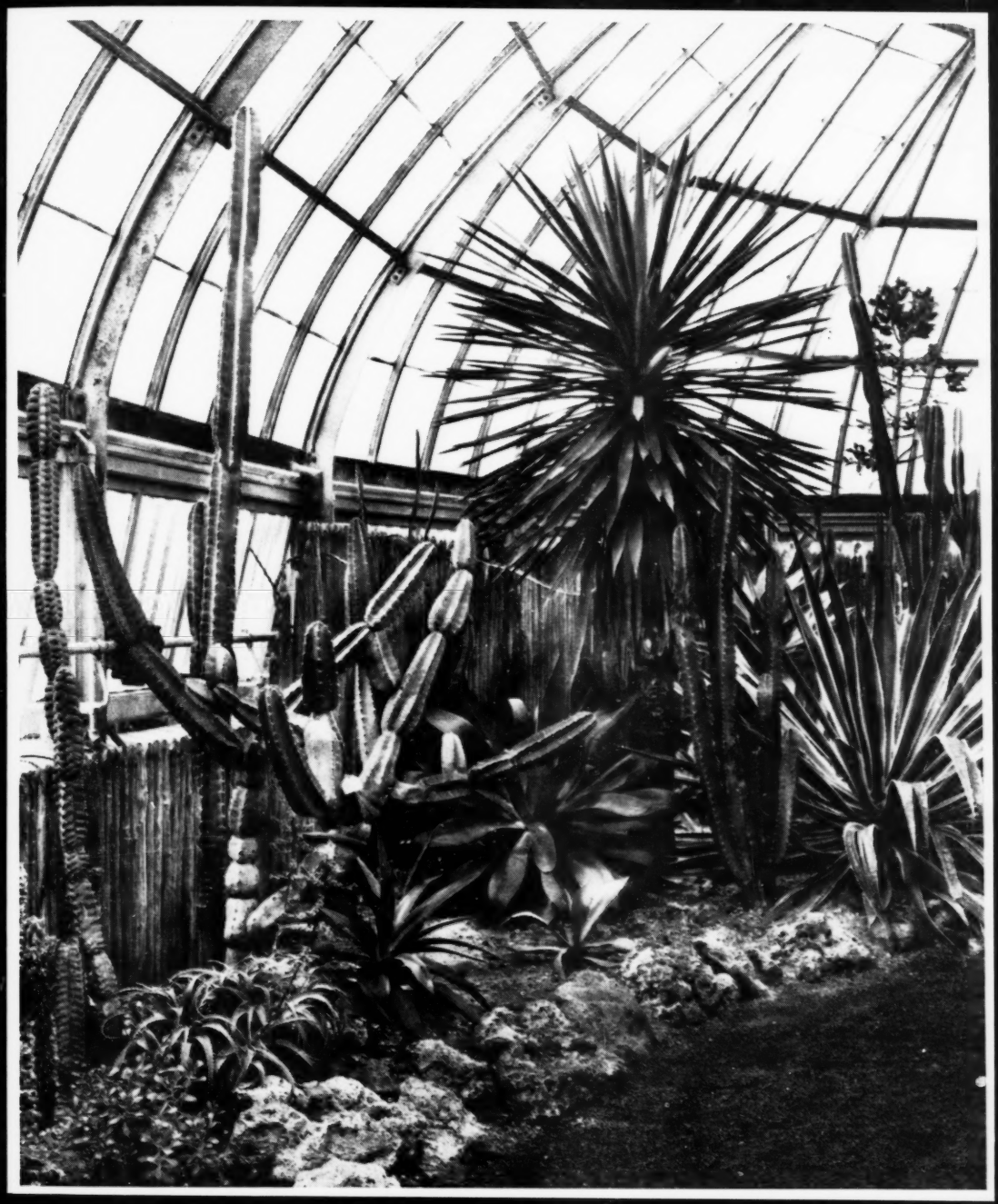


THE GARDEN JOURNAL

THE NEW YORK BOTANICAL GARDEN

THE GARDEN JOURNAL

THE NEW YORK BOTANICAL GARDEN

DOROTHY EBEL HANSELL
Editor

CALENDAR

February 28, 1961. Members' Evening of The New York Botanical Garden. See inside back cover for preliminary announcement.

March 4-12, 1961. International Flower Show, Coliseum, New York City: theme, "Gardens for Outdoor Living."

March 5-11, 1961. Philadelphia Flower Show, Trade and Convention Center: theme, "The Fifty States of the United States."

March 11-19, 1961. New England Spring Flower Show, Wonderland Park, Revere Beach, Massachusetts: theme, "Gardens of the Americas."

March 19-24, 1961. Colonial Williamsburg Garden Symposium, Williamsburg, Virginia: theme, "Keys to Garden Pleasure."

April 18-28, 1961. Third International Rock Garden Conference arranged jointly by Alpine Garden Society in London, with cooperation of the Royal Horticultural Society, and Scottish Rock Garden Club in Edinburgh, with cooperation of Regius Keeper, Royal Botanic Garden, Edinburgh.

April 22-29, 1961. Twenty-eighth annual Historic Garden Week in Virginia.

April 28-June 15, 1961. Fiorio del Mondo a Torino, Valentino Exhibition Palace and Grounds. For information, write Guiseppi Ratti, Via Pomea, 32, Turin, Italy.

May 2 and 9, 1961. City Gardens Club—annual showing of gardens and pent-houses terraces in New York, N. Y.

May 4, 1961. Spring Garden Tour to Bucks County, Pennsylvania, sponsored by The Volunteer Associates of The New York Botanical Garden.

May 12-14, 1961. International Rhododendron Conference in Portland, Oregon, under the auspices of the American Rhododendron Society.

April 27-May 7, 1962. Floralies, International Horticultural Exposition under auspices of Société d' Horticulture and Jardin Populaires de France in Valenciennes, France.

CONTENTS

January - February, 1961

BOTANICAL PROBLEMS IN ARCTIC AMERICA
William Campbell Steere 1

CONCEPTS OF CONSERVATION 6

CONSERVATION EXTENDS TO BIRDS 7

STEPHEN G. MATHER, FATHER OF THE NATIONAL PARKS
Conrad L. Wirth 8

THE WILD FLOWERS OF THE NEW YORK AREA
Joseph Monachino 11

CONSERVATION PRACTICES GIVE ZEST TO GARDENING
Arthur B. Beaumont 14

YEAR-ROUND FLOWER PRODUCTION AT ERDENHEIM FARM
William H. Weber 16

FOREST PLANTS ON A CITY HOMESITE
Ray R. Hirt 19

A COUNTRY HOUSEWIFE'S GARDEN
GERTRUDE B. FOSTER 22

ROUND-THE-WORLD IMPRESSIONS OF FLORAL ART
Esther Wheeler 23

THE TORREY BOTANICAL CLUB HONORS BERNARD OGILVIE DODGE 24

"FLOWER DAYS" AT HEIDELBERG
Herman F. Becker 25

BOOK REVIEWS 27

NEWS, NOTES, AND COMMENTS 29

LETTERS TO THE EDITOR 36

CREDIT FOR ILLUSTRATIONS

We are indebted to the Display Committee, Mrs. Charles Burlingham, Mrs. Richard S. Meredith, Mrs. Donald B. Straus, for the selection of the front cover illustration—a scene in the cactus and succulent house of the Conservatory of The New York Botanical Garden, photo by E. N. Mitchell; pp. 2-5, W. C. Steere; p. 8, U. S. Forest Service; p. 9, National Park Service; pp. 12, 13, Gottscho-Schleisner; pp. 14, 15, 16, U.S.D.A. Soil Conservation Service; p. 17, Philadelphia Inquirer; p. 18, Biagio Pinto; pp. 19, 20, Ray R. Hirt; p. 23, Information Office, Consulate General of Japan; pp. 25, 26, Herman L. Becker; p. 30, E. N. Mitchell; p. 31, Geo. W. Park Seed Co.; p. 32, The Wayside Gardens Co.; p. 33, Esther Wheeler.

The Garden Journal is published bimonthly by The New York Botanical Garden, Bronx Park, New York 58, N. Y. at 400 Watchung Ave., Plainfield, N. J. Second Class Postage paid at Plainfield, N. J. Annual subscription, $3.00. Single copies $.55. Foreign countries and anywhere outside the continental United States, $.50 a year extra.

BOTANICAL PROBLEMS IN ARCTIC AMERICA

By WILLIAM CAMPBELL STEERE

Dr. Steere is Director of The New York Botanical Garden. He delivered the following address as the retiring president of the Botanical Society of America at the annual meeting of the Society at Oklahoma State University, Stillwater, August 31, 1960.

I SELECTED THE TOPIC, "Botanical Problems in Arctic America," as being timely because of the recent admission of Alaska to the Union as the forty-ninth State, because of the large amount of publicity given to the activities of the International Geophysical Year in arctic and antarctic regions, and because of the increasing importance of our northern outposts in the military defense of this continent. Moreover, after eight field seasons in arctic and subarctic Canada, Alaska, and Lappland, I have developed some ideas and some questions that may well be of interest to a group of my botanical colleagues.

World War II brought about the sudden accessibility of the arctic. As a result, more botanists have visited arctic America in the last fifteen years than in all previous history put together. The reasons for this increased accessibility and the concomitant invasion of the arctic by botanists are several and diverse. Among them are the development of easier and faster methods of transportation such as bush planes on floats, wheels, or skis, and tracked vehicles such as weasels and snomobiles instead of dog-sleds; the establishment of new bases for radar sites, weather observations, oil exploration, and other purposes that may be used as research centers; the availability of research grants adequate for arctic exploration as well as other types of field support; and not necessarily least, the development of repellents effective against the hordes of unbelievably voracious mosquitoes and other biting insects.

My admiration for early botanists, geologists, and other scientists in arctic regions knows no bounds. The rigors of travel described by Linnaeus for his 1732 journey to arctic Lappland were no greater than those endured by botanists in Greenland and in northern Canada and Alaska up to two centuries later, assailed as they were by difficulties of travel, uncertainty of food supply, and plagues of insects. Dr. Wulff, a Swedish botanist, died in Greenland in 1917 of exposure and exhaustion.

Today, thanks to the availability of excellent logistic support and adequate transportation facilities, the major danger level has been reduced to indigestion from eating too much of one's own cooking. The dangers of falling from a cliff, crashing in a bush plane, starvation—or even vitamin deficiency, or being charged by an enraged bear or muskox are more than equally matched by the dangers of slipping in the bathtub at home or being run over while crossing the street.

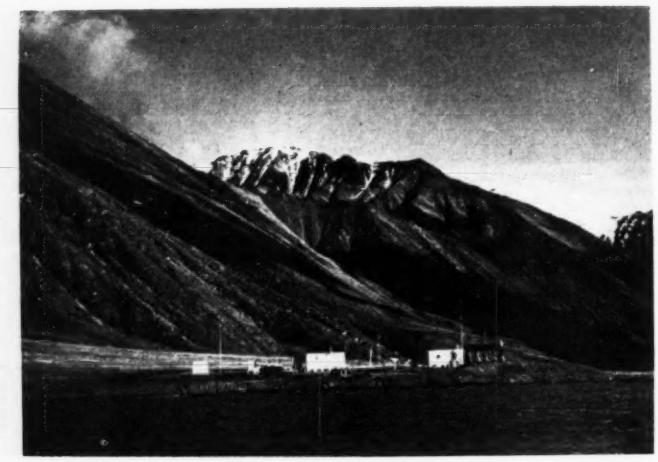
Arctic Europe has become especially easily available for scientific work. The railroad built across Lappland in 1903 to carry the rich ores from the great iron mines at Kiruna, at nearly 68° North Latitude, runs west to the Norwegian city of Narvik and east to the Baltic port of Lulea, with most of its length north of the Arctic Circle. Crossing the Arctic Circle in a comfortable train seemed almost ridiculously easy to me, after five field seasons in arctic Canada and Alaska. The contrast is exaggerated by the comfortable tourist hotels on the south shore of Lake Torneträsk and the ease with which one may go from one station to another in interesting areas on trains which run with the frequency of suburban commuters. On the North American continent no highways nor railroads cross the Arctic Circle, but many regularly scheduled airline flights do, and one also may easily charter a flight to any area off the regular airways where landing is possible. Tourtist hotels of sorts are available at Kotzebue, Barrow, and elsewhere north of the Arctic Circle.

The two physical characteristics of the American Arctic that most influence the distribution and behavior of plants are the permanently frozen ground and the long days during the growing season. The long winters and brief summers in themselves produce an effect that differs only in degree from that found in more temperate climates.

Permanently frozen ground, whether wet or dry, soil or rock, was termed "permafrost" by Simeon Muller in 1943 in his review of the extensive Russian studies of frozen ground in Siberia. Although long accepted as a fact of life in northern Canada and Alaska, permafrost became a critical factor to engineers engaged in the construction of airstrips and military bases during World War II. Its study has consequently progressed rapidly, with contributions to the solution of geological and biological problems as well as engineering. One botanist, William S. Benninghoff, has become a leading expert on permafrost. The term permafrost has been objected to on facetious grounds by some, and seriously by others; but because it is simple and obvious, it will continue to be widely used in non-technical circles. Professor Kirk Bryan has proposed to replace permafrost with "cryopedology" as the science of frozen ground, with a whole family of subordinate terms such as "cryoplanation," "congeliturbation," "pergelation," "congelifraction," for specific situations. These terms appear more and more frequently in technical papers.

In its northernmost range, permafrost may be extremely thick. It has been reported to extend two thousand feet downwards in Siberia and is well over one thousand feet thick in northernmost Alaska. At its southern boundary it becomes very thin and discontinues and eventually disappears. The origin of present-day permafrost dates from the beginning or from some later phase of the Pleistocene Ice Age, so that it may be as much as a million years old. Pleistocene-Age mammoths frozen into the permafrost have been found so abundantly in Siberia that they furnished for many years the largest single source of commercial ivory.

Permafrost develops where and when the annual mean temperature is from very slightly to very considerably below freezing. It is also influenced by plant cover which may



Lake Peters Research Station, at an altitude of twenty-eight hundred feet, in the eastern part of the Brooks Range, Alaska. This Station is administered by the Arctic Research Laboratory at Point Barrow.

furnish insulation and thereby retard thawing, by serving as a differential heat regulator. Conversely, the removal of the vegetation mat may upset the thermal regime and hasten thawing.

Permafrost must be discussed here because of its all-pervasive effects on the growth of arctic plants and its many correlations with arctic vegetation.

1. The maximum depth of superficial thaw each year, the so-called active layer, effectively limits or determines the plants that may grow there. If the active layer is as thin or shallow as three inches, it will support only sedges, grasses, and other fibrous-rooted plants without tap roots. Mosses, of course, with no roots flourish in abundance. Pine is ruled out in permafrost areas because of its deep tap root, whereas black spruce and larch do very well and extend considerably north of the Arctic Circle, where their limit is determined by climate and not by permafrost.

2. Permafrost provides a base impervious to drainage. Combined with the low evaporation rate, water tends to accumulate in spite of the extremely low precipitation. In flat areas more than half the land surfaces may be covered with lakes and ponds, and moderate slopes may become water-logged through moss-cover that obstructs drainage. One may be tempted to call this area the wettest desert in the world.

3. The frozen permafrost surface provides a lubricated base for down-hill movements of water-logged soil so that even very gentle slopes tend to be unstable and in motion, sometimes with a very disrupting effect on the vegetation.

4. Frost action keeps soil, gravel, and rock fragments in continual local movement, even when not sliding gradually downhill. This boiling, churning action, called congeliturbation, destroys the normal chronological stratification that we expect to find in soils. The pressure of freezing water causes the extrusion of materials from lower layers, much as milk is extruded from a bottle when frozen. Soil mounds are produced thereby, commonly a few feet high, but more rarely, under the influence of hydrostatic pressure, the mound may become a small hill or "pingo" twenty feet or more high.

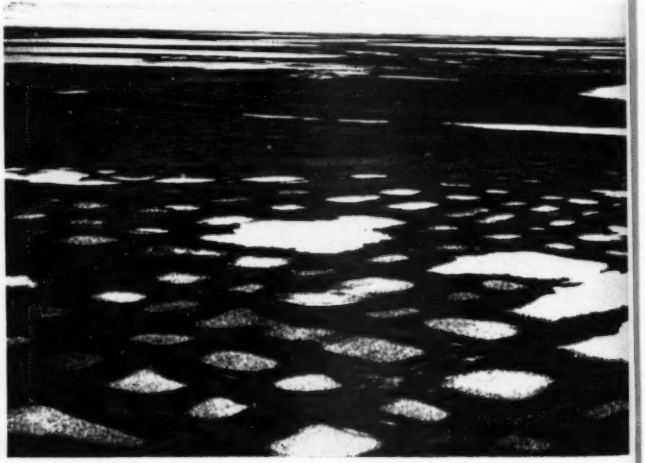
5. The boiling and churning of the ground has a second effect—the particles and materials of stony soils are sorted in circles or polygons on flat ground and in "stripes" and rock-streams on mountain sides. The smaller particles move inwards and the larger materials outwards. In wet soils the polygons are separated by vertical ice-wedges that exert greater and greater pressures on the enclosed soil as they grow in depth and thickness. The development of polygons produces a strong and conspicuous effect on the vegetation. The "patterned ground" that is produced by frost action is the most conspicuous single feature of arctic areas, and the presence of polygons always gives visible evidence of the existence of permafrost.

6. In a general way, permafrost has many other effects. If the superficial insulative layer of vegetation is removed, the underlying permafrost will melt, as engineers learned to their sorrow in early experience with air-strips in Alaska. Where the vegetation had been bulldozed off and heat absorption exaggerated by the construction of black asphalt runways, the surface curved and buckled in waves. Relict ice blocks in the soil at the margin of the permafrost area can be a nuisance or even a hazard to agriculture when they melt, as has been seen at Fairbanks where large caverns have developed underground. Unfortunately, no plant indicator has been discovered for deep-lying permafrost, although some quantitative effect may eventually turn up with more intensive local study.

The construction of buildings on permafrost brings many engineering problems. Buildings even on pilings may transmit heat into the permafrost through the pilings with a consequent gradual settling as can be seen, for example, at the post office in Nome. Inhabitants of houses with insufficiently insulated floors may be surprised when suddenly the stove drops into a deep pool of mud. I have seen photographs of settlers' cabins in Siberia where downward melting reached an aquafer or water stratum under pressure, which then flooded the house and almost immediately froze.

The physiology of plants growing under permafrost conditions has not been well investigated and is not well known in this country. Some work has been done on plants growing and even flowering under snow, where temperatures may be above freezing and where little movement of air occurs. However, plants up to the size of trees that grow with their roots almost upon permanently frozen

"Patterned ground" in the tundra near Point Barrow. The polygons are formed by the growth of vertical ice wedges between them and are highly typical of permafrost or perennially frozen ground.



Mrs. Steere and a weasel—a light-weight, tracked vehicle that makes tundra travel feasible.

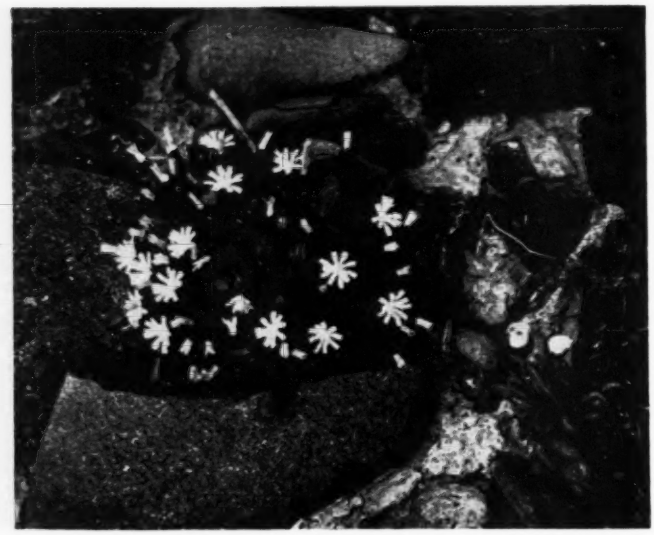
ground and with their tops in air whose temperature is well above freezing would seem to be in a state of perpetual crisis. The late Professor George Peirce of Stanford University once told me, with his usual humor, that it was obviously quite impossible for plants to do this. Since plants *do, how* they do it certainly needs careful study. Whether the physical chemistry of the roots and root-hairs of arctic plants differ in some way or to some degree from that of plants in temperate climates still remains to be determined. The limitation of all the subterranean activities of plants to the several inches of soil that thaw for a few weeks in summer presents a situation far different from the one most of us consider to be normal.

Long days during the growing season especially characterize the arctic—in fact, the Arctic Circle is demarcated by that latitude at which the sun does not set one night of each year. The higher the latitude, the more "nights" of sunshine, and even though the sun may set in subarctic areas, the nights are nevertheless light enough to support the growth of plants. The continuous light is the phenomenon first noted by the new visitor to arctic areas and is the condition most difficult to imagine until experienced. When one wakes up at 1:30 in the morning with the sun shining in his eyes, it is difficult to convince his physiological control system that day has *not* arrived and to relax and go back to sleep. The occupational hazard experienced by vigorous people in the arctic is insufficient sleep and overwork. Like people, plants must certainly respond otherwise in nature to continuous light than they do to the diurnal light rhythms of lower latitudes; yet little experimental work has been done in the arctic with the plants that grow there. Obviously, on the pragmatic evidence that arctic plants produce flowers and seeds, they are long-day plants. Short-day plants which may have existed under earlier and more temperate climates at the same latitudes have undoubtedly disappeared through inability to reproduce. The high incidence of apomixis, bulbil-formation, and other devices for vegetative propagation may reflect some adaptation to continuous light and the long-day requirements imposed thereby. The very common comparison of plants of high altitudes with those of high latitudes and the lumping of both categories as arctic-alpine plants tend to underemphasize or to conceal the great difference in day-length conditions, which in turn must be reflected by real differences in the physiology of the plants themselves.

Just as the Arctic Circle is circumscribed by that latitude at which the sun does not go below the horizon one night each year, so it also coincides with the latitude at which the sun does not rise above the horizon one day of the year. At higher latitudes many days have only twilight, and many others are short, indeed, exactly compensating in length for the opposite seasons. I should mention here the too common misconception that the arctic is the land of "six months of light and six months of darkness." I have heard serious botanists invoke Wegener's hypothesis of the wandering of the earth's poles, not because of the good reasons given by Wegener, but because they cannot honestly believe that the luxuriant forests that once reached the farthest northern lands and are represented now only by abundant fossils could have developed under six months of darkness. The presence of coal and abundant plant fossils in Antarctica raises the same question in a more aggravated form. Actually, of course, the darkness, twilight, and very short intervals of light would come during the dormant winter period when photosynthesis is suspended because of low temperatures. The present limit of trees northward on the various continents is determined by temperature and perhaps by other climatic factors, not by the shortness of day in winter. Forests of one type or another extend well north of the Arctic Circle in Scandinavia, in Siberia, and in North America. Both black spruce (*Picea mariana*) and larch (*Larix laricina*) reach the Arctic Ocean at the mouth of the Mackenzie River in northern Canada, but the tree-line abruptly retreats southward toward Hudson Bay and the Ungava Peninsula, paralleling very neatly the depressed isotherms of the mid-continent. In short, one does not have to invoke the wandering of the earth's poles, whether they wandered or not, to explain the presence of forests in polar areas in earlier geological eras, but only a somewhat warmer and more uniform climate.

...It would be impossible to discuss all the important and exciting botanical investigations called for in arctic regions. I shall mention a few general problems to point up the different dimensions and different parameters of botanical research in the arctic.

Although we are well acquainted with the reduced activity of microorganisms at lowered temperatures in the laboratory—and in the home refrigerator—we rarely see its effects in nature. At Barrow and in other arctic seaside villages, the Eskimos abandon everywhere the unused remains of seals, walrus, and whales that they have killed during the spring, adding much thereby to the picturesqueness of their habitat. However, instead of the galloping and richly odoriferous putrefaction inevitable in a warmer climate, decomposition takes place slowly under the low temperature and dry atmosphere, producing only a somewhat rancid but not wholly repulsive odor to which one's nose eventually adjusts. Beyond this, much remains to be known about the microorganisms of the soil, the water and the air in arctic regions, with especial reference to their metabolic activities.



A natural rock garden. *Agroseris* is a tiny relative of hawkweed and dandelion.

The fungi of arctic America have received very little attention from professional mycologists. Dr. Douglas Savile is one of the few mycologists who has worked in the Canadian Arctic Archipelago. Since agriculture is relatively unimportant in arctic regions, no economic incentive has precipitated a broad survey of even the parasitic fungi.

Large marine algae are less conspicuous in arctic seas than in even slightly more southerly waters, not because of temperature, but because of the scouring and grinding effect of floe ice on the shores. Although marine algae do occur at some depth and are washed up on the beaches after storms during the ice-free season, no intensive study of them has been made. The growth and productivity of marine plankton of the Arctic Ocean need study urgently, and such investigations would be well supported by several agencies. Fresh-water algae are abundant and occasionally form conspicuous "blooms" in tundra lakes and ponds. Dr. G. W. Prescott and his students have pioneered research on the fresh-water algae of arctic Alaska and on the dynamics of their ecology, but most northern areas have received little organized study by phycologists.

The bryophytes, because they form a rather conspicuous part of the terrestrial vegetation, have received serious attention through field studies in arctic America. Although the basic systematic inventory is reasonably complete, continuing problems of significance lie in the area of ecology, geographical distribution, cytology, and physiology of bryophytes, as well as their relation to permafrost.

Since earliest times the flowering plants have traditionally received more attention than other groups of plants, and nearly five hundred species have been found on the arctic slope of Alaska alone. The critical studies by Wiggins, Porsild, and Hultén on geographical distribution and by Löve on chromosome numbers have produced interesting and useful results. Löve has brought forth much evidence to support the hypothesis, proposed by Hagerup, that arctic plants show a greater degree of polyploidy and therefore possess a greater gene pool or genetic resource with which to resist the unfavorable environment. Cytological research on the growth of roots very close to permafrost and of meiosis in flowers that are subjected to daily temperatures below the freezing point should yield results of great interest.

As implied throughout, the very physical conditions that make the arctic region what it is lead inevitably to ecological problems that need solutions. An excellent analysis of the vegetation dynamics in Alaska has been made by Dr. Max Britton, and we await with impatience the publication of the results of his sophisticated and cleverly instrumented studies of microenvironments and their microclimates at Point Barrow. The results of his ecological researches will be useful to workers in every other biological field.

For genetic and biosystematic studies in such large and enormously complicated arctic groups as willows and locoweeds, among others, some sort of botanical garden must eventually be established in northern Canada or Alaska—or both. Genetical studies of species related to horticultural varieties will certainly turn up genes for hardiness and resistance as well as other desirable characteristics for use in plant-breeding programs. The genetics of fertility and sterility in arctic plants likewise need study, because of the alternative means of vegetative reproduction they display.

Although paleobotanical work in Alaska began early, this is still a highly promising field because of the abundance of fossils and the existence of forests in previous geological

Left. *Claytonia tuberosa*, a large flowered arctic relative of our own spring-beauty. In Alaska, the tubers are eaten by the Eskimos. Center. *Dryas drummondii*, a handsome yellow-flowered species of mountain avens.

Right. *Androsace ochotense*, a Siberian species that occurs rarely in arctic Alaska. The plants are densely tufted, with beautiful clear pink flowers. Photographs taken at Great Bear Lake, Northwest Territories, Canada.

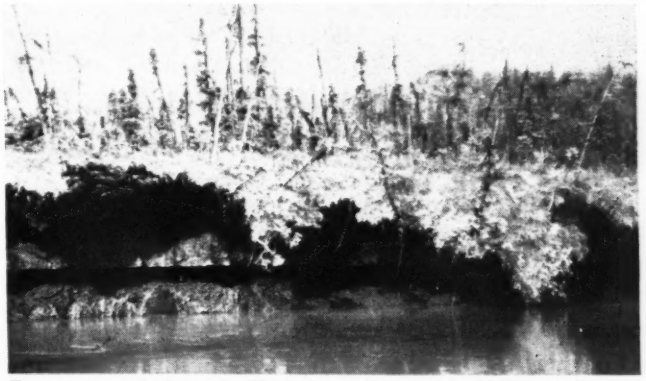
eras where only tundra now occurs. Microfossils, especially spores and pollen grains, have not received the attention in arctic areas that they deserve, except for the private, probably never-to-be-published works of oil companies; these use their data for the purpose of correlating geological horizons in exploration for oil which, incidentally, is surprisingly abundant in arctic Alaska. The use of carbon-14 techniques and other modern dating methods in the arctic will give data extremely helpful for undertanding the dimension of time during which the present types of vegetation have developed, as well as the cyclic changes in past climates.

At the moment, the most experimental and highly instrumented kinds of investigation of the behavior of plants under arctic conditions may have to be carried out in the well-equipped laboratories of more temperate regions. However, where natural conditions cannot be duplicated or even imitated, such experiments will eventually have to be made in the arctic, as facilities become available.

The Arctic Research Laboratory at Point Barrow, the northernmost part of the United States, offers many opportunities for research in arctic Alaska—in any appropriate field of science. Operating through the University of Alaska, the Geography Branch of the Office of Naval Research has for several years provided funds for the support of the Arctic Research Laboratory. Scientists who have research funds available to them from the Office of Naval Research, the National Science Foundation, the Arctic Institute of North America, or other responsible agencies, and whose research falls within the scope of interest and activity of the Arctic Research Laboratory, may apply for the privilege of working there. If space and other facilities permit his residence at the Laboratory, the scientist is provided with full logistic support, which means that he is furnished with food, lodging, heavy clothing, and is placed in the field as his plans require or else given laboratory space and equipment for his work in one of the seventeen laboratories. . . . At the moment, facilities are available and much scientific work is going on near Cape Thompson, between Kotzebue and Point Hope. Here the Atomic Energy Commission has established a base for extensive environmental studies before some proposed underground explosions of atomic materials are detonated in a year or two. . . . Other facilities for research in arctic Alaska may occasionally be found in the various Distant Early Warning or DEW Line sites along the arctic coast of Alaska and Canada, as well as in other quasi-military establishments. With a research grant adequate for chartering the service of a bush plane, a properly equipped investigator can reach nearly any area of arctic Alaska in which he wishes to work, quite independently of the agencies or bases just mentioned. However, in my opinion, one is well advised to work through the Arctic Research Laboratory or the Arctic Institute of North America, or both, because of the facilities and logistic services that these organizations can give, as well as their experience in cutting red tape.

In Canada, the Defense Research Northern Laboratory at Churchill, on the west coast of Hudson Bay, offers excellent facilities to investigators with research problems appropriate to the geographical locale, at the tension zone between the forest and the tundra. Although the latitude is only subarctic, the depressed isotherms of the mid-continent produce an arctic climate which in turn controls the limit of trees. Occasional highly qualified workers have been accommodated in weather stations and other establishments on the various islands of the Canadian Arctic Archipelago, even as far north as Alert, on Ellesmere Island, at a latitude of 82°. Again, with adequate funds for transportation, sufficient equipment, and the essential approval of the proper authorities, a serious worker can place himself in any geographical spot whose circumstances are more appropriate to the requirements of his work.

It may be appropriate to note here that the University of Copenhagen's Biological Laboratory on Disko Island, on the west coast of Greenland, is probably the oldest arctic scientific station in existence. Admittance to the Laboratory and permission to work anywhere in Greenland are given by a central commission on arctic research, at the University of Copenhagen. Moreover, workers must be able to qualify for a Danish visa and for official permission to visit Greenland. Occasional researchers with special needs have received permission to center their investigations at U. S. installations, at Sondrestromfjord, at Thule, and at other bases in Greenland. . . .



Frozen ground along the Kuskokwim River near McGrath, Alaska. Floodwaters have melted away the permafrost from under the thin rug-like mat of moss and roots to which all surface life of plants and animals is restricted.

I am obliged to add somewhat parenthetically that the Russians have far more arctic scientific research and experimental bases and stations than America does, scattered through the vast reaches of the Siberian arctic and the arctic islands north of the Eurasian continent. Whether scientists from outside the Iron Curtain are welcome or even tolerated in these laboratories, I do not know. My only advice to anyone who is resourceful enough to arrange an invitation to work in one of the arctic research stations in the U.S.S.R. is that he insist on a round-trip ticket.

In arctic regions every field of botany, every plant science —and every science—present innumerable problems that demand investigation. These problems are challenging and timely, and many are now of real importance to our national welfare. Moreover, because of the novel environmental conditions and the relatively small amount of previous work, investigations of arctic problems are very apt to be unusually rewarding and productive. As I review the foregoing remarks, it occurs to me that I might have selected, with equal suitability, the title "Botanical Opportunities in Arctic America."

CONCEPTS OF CONSERVATION

"SCIENCE SO FAR has devoted itself to many fields, but up to the present has never concerned itself with the preservation of simple beauty and landscapes for the creation of childhood memories. Artists and illustrators continue drawing colorful pastoral scenes rich in flowers and animals as decorations for children's stories. Psychologists have from time to time condemned fairy stories for the illusions and complexes that they build up in the minds of children. What complications then will arise, or are arising now for that matter, from the use of peaceful countrysides and profuse floras and faunas in the child's book? Certainly there is no greater illusion for the city child than the idea that such scenes are enduring, well-taken-care-of parts of the world in which he is growing up. . . .

"City children have no concept of wildness, of the rhythm of natural events, of the significance of non-human forms of life, of the inter-relationships of living things and the land. At the same time present and future generations are faced with the very difficult problems of dealing sensibly with river and stream control, erosion control, human nutrition, and prevention of disease, both physical and mental, resulting from abnormal developments in society. Even a brief consideration of these problems demonstrates the need for a public familiar with the land and conscious of the existence of natural laws. If, as children, adults have had contact with the beauty, peace, organization and the thrill of wild plants and animals in their natural habitats, it will be that much simpler for them to understand problems involving man and his environment....

"Highways radiating from the city gradually force wild places into the distance, and the quest of country lanes is forgotten in the thrill of speed. . . .

"...I often wonder where my child can go to learn what this earth was like before he was born. . . ." Alfred G. Etter, Associate Professor in the Department of Fisheries and Wildlife, Michigan State University, in *The Land.*

Mindful of the scene of his youth where he spent many hours enjoying the natural beauty as he tramped through the wooded glen, Hugh Taylor Birch deeded nine hundred and twenty acres to Antioch College, to be known as the Glen Helen Memorial in memory of his daughter Helen. These acres are "an outstanding living museum of primeval America," their geology and flora unique in Ohio and neighboring states, and on them Antioch College is conducting an excellent program in conservation education.

When Alton A. Lindsay of Purdue University and an officer of the Ecological Society of America, learned that Glen Helen was theatened by a wide highway, he said, "...this country could soon find itself with a dense venous network of super highways, but nothing left outdoors worth traveling them to see." Fortunately, the citizens of Ohio and elsewhere raised sufficiently strong protests, the highway has been relocated, and the youth of today and tomorrow in Ohio and adjacent states will have Glen Helen in which to enjoy cliffs, streams, and springs; trees, wild flowers, birds, fish, and game.

In the words of Theodore Roosevelt, "The nation behaves well if it treats the natural resources as assets which it must turn over to the next generation increased and not impaired in value. Conservation means development as much as it does protection." Conservation means not wasting, but using wisely renewable natural resources—forests, water, soil, plants, and wildlife—"for the greatest good of the greatest number for the longest time." It is necessary not only to provide places of natural beauty for the oncoming generations, but to instill in them an appreciation of such beauty, to instruct them in ways of conserving and protecting the nation's natural resources, to impress upon them that man's continued existence depends upon the conservation of the soil, forests, minerals, water.

In the Watchung Reservation of Union County, New Jersey, an exceptional program in conservation education is being conducted by Dr. H. N. Moldenke, the Director of its Trailside Museum. Dr. Moldenke was formerly a member of the staff of The New York Botanical Garden. The Trailside Museum has exhibits of plant and animal life, insects, soils, stones, minerals, shells, and so on, some of them very attractively staged, all well labelled. Informative literature is available, and instructive lectures are given on Sunday afternoons. In addition, Dr. Moldenke has prepared mimeographed material on worthwhile conservation projects that can be carried out by Boy and Girl Scouts and other youth groups.

The people of Union County, adults as well as youth, are fortunate in having the Trailside Museum and the Watchung Reservation, because they live in a region that has been changed from rural to urban within the past twenty years. The exploding population and the urbanization of many regions throughout the United States makes it vitally important that certain areas be retained in their natural state, else plant and animal life will be dissipated.

In the *Bulletin of the Garden Club of America* (Vol. 48. No. 3), Richard Pough wrote, "Land is a unique commodity. From it springs most of what we need to live and enjoy life. Although indestructible, it is non-expandable. Thus as our population grows through the centuries ahead, there will be a greater and greater need for lands so that all those with outdoor interests can share. Nothing we own is quite as precious as land, and nothing we can do can have as great an impact for good or evil on coming generations as the disposition we make of the land we own."

As far back as the 1960's, one hundred years ago, some people began to manifest concern about the waste of our forests and the disposition of public lands. Land for the first state park was set aside in 1865; for the first national park in 1872. Articles began to appear in newspapers and magazines. Charles Sprague Sargent, the first director of the Arnold Arboretum, wrote an article on "The Protection of our Forests" in *North American Review* in 1882. Charles W. Eliot of Harvard University was another who wrote several articles on the subject at the turn of the century.

In 1891 the first forest reserves were withdrawn from public domain; six years later provision was made for their administration; and in 1898 Gifford Pinchot was appointed head of the Federal Division of Forestry.

Although more voices were lifted in alarm in the early 1900s, most people looked upon the forests as "something to be cut down and used for lumber or fire wood" when Theodore Roosevelt became President of the United States.

He called the First National Congress on Forestry in 1905 and the first conference of governors for an inventory of the nation's natural resources in 1908. It was Pinchot who proposed a national conservation program; and Roosevelt, with such dedicated men as Pinchot and Frederick H. Newell as his aides, succeeded in convincing some of the country's leading citizens that the conservation of its forest resources was important to the national economy and that their management required a sound program under trained leaders.

During the past half-century many men have rendered services of inestimable value to the conservation and preservation of the nation's natural resources, but certain individuals stand out prominently. Pinchot and Newell in forest conservation; Dr. Hugh H. Bennett and Dr. W. C. Lowdermilk in soil conservation; Stephen T. Mather and Horace M. Albright in the National Park Service; Jay N. Darling and Ira N. Gabrielson in wildlife management; and Dr. Paul B. Sears in conservation education.

Organized groups have exerted tremendous influence and contributed generously to conservation projects—to the establishment of memorial gardens and sanctuaries, to the restoration of places of historical, horticultural, and botanical significance, to the enlargement of parks, to the preservation of national monuments and natural areas. The Garden Club of America, the state federations of garden clubs, The Nature Conservancy, the National Audubon Society, Wildflower Preservation Society of America, Nature Association, Wildlife Management Institute, Save the Redwoods League, Inc., and Resources for the Future, Inc., are only a few of the numerous organizations that are actively engaged, in one way or another, in conservation programs.

The National Audubon Society, at its annual meeting in New York City in October 1960, was informed by Dr. James T. McBrown of the U. S. Fish and Wildlife Service that the only hope of preserving water fowl was an accelerated program to purchase wetlands before they were all lost to drainage and flood control; otherwise water fowl will be relegated to the care of zoos in cities.

At the meeting of the Torrey Botanical Club on November 1, 1960, Dr. Richard E. Goodwin, Professor of Botany at Connecticut College and former president (1956-58) of The Nature Conservancy, spoke on the urgent need to preserve the vanishing natural areas of this country. This non-profit membership organization is "dedicated to the preservation, in their natural state, of biologically and geologically significant examples of the American landscape," of setting aside and protecting forests, salt marshes, sand dunes, sphagnum bogs, pine barrens, deserts, western prairies, arctic alpines, and southern savannas from disturbance by man. Many of the fascinating biotic communities — communities of plants and animals living in integrated units — have disappeared. The tall beautiful grasses of the plains and prairies have been replaced by wheat and corn; marshes have been drained and put under cultivation; the sand dunes have been removed and converted into shore resorts.

The Nature Conservancy, incorporated in 1950, was an outgrowth of a study made by the Ecological Society of America. Its first piece of real estate was acquired in 1954. Today it owns and manages forty preserves. It aids others legally and financially, as, for example, Mettler's Woods near New Brunswick, New Jersey, and the Mianus River Gorge in Westchester County, New York, near the Connecticut line. In these natural areas people find mental and physical refreshment; and botanists, ecologists, geologists, and other scientists are afforded the opportunity to study vegetation and wildlife in their natural environments. A number of these natural areas are near educational facilities —accessible to secondary schools as well as to institutions of higher learning, for The Nature Conservancy recognizes that "unless the school children of today are imbued with an appreciation of nature, they will not be ready to provide the sustaining influence required for the continued protection of our country's remaining natural resources."

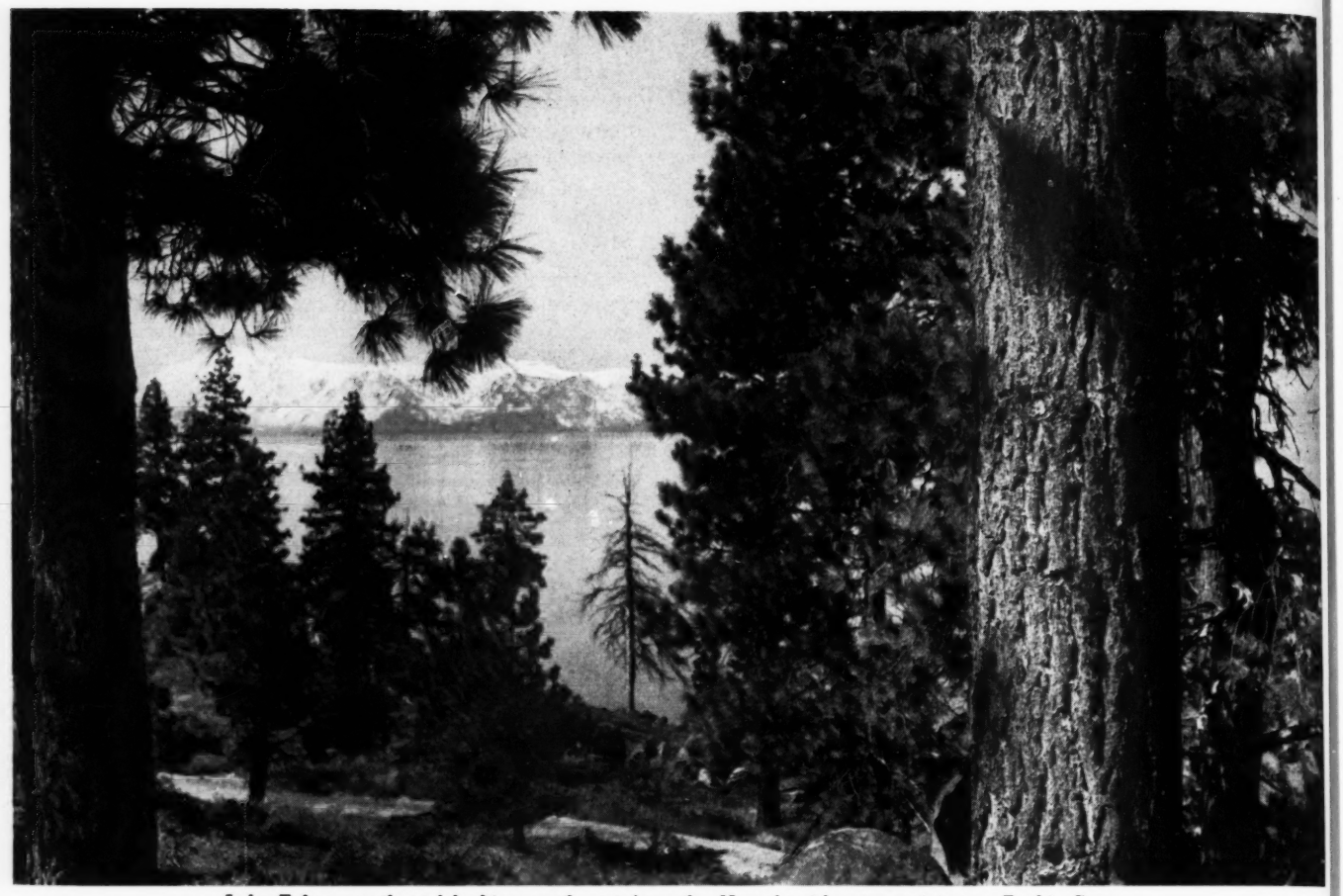
The need for conservation has been emphasized so extensively that it would seem unnecessary to caution Americans to remain alert to encroachments upon the nation's natural resources. But as Paul B. Sears wrote in *The Garden Journal* (Vol. 3: p. 2. 1953) "There is unremitting pressure from those who would turn a nimble dollar by picking the landscape to the bare bones." Not all the blame, however, for defacing or destroying natural resources can be laid upon private individuals and commercial firms. There are times when one government agency is bent on invading park land or a natural area and another government agency is striving to resist such encroachment and provide protection. Within the past few years residents of several counties in New Jersey have become familiar with such predicaments. They have been confronted with proposals to flood farmlands in Warren and Hunterdon Counties for a new reservoir; to cut through Watchung Reservation for a limited-access freeway; to drain the Great Swamp, with its unique plant and animal life, in Morris County, for a jet airport. All required, so the proponents claim, for the "March of Progress."

Man's dependence on natural resources is more than material. He travels afar to the wilderness areas, to the national parks and monuments; he visits the smaller green pastures nearer his home, the sanctuaries and public gardens, for spiritual inspiration. "Conservation goes far deeper than the matter of bread and butter," quoting Dr. Sears again. "It involves the whole concept of freedom, dignity, and the American people."

Conservation Extends to Birds

THERE ARE THOSE who complain about birds—that they are a nuisance, that they cause damage from time to time. Some birds, it is true, have proved troublesome. For several years starlings devoured the berries on trees in holly orchards in the Northwest and ruined the crop. Generally, however, birds are a valuable asset to farmer and gardener, as well as a pleasure to observe and to hear. They feed on many kinds of insects and weed seeds. The U. S. Department of Agriculture calculated some years ago that the value of birds in controlling insect pests is more than three

(Continued on page 10)



Lake Tahoe, south and looking southwest from the Nevada side at a point near Zephir Cove.

STEPHEN G. MATHER, FATHER OF THE NATIONAL PARKS

By CONRAD L. WIRTH

Mr. Wirth, Director of the National Park Service, delivered an address at the dedication of the Stephen Tying Mather High School in Chicago, Illinois, on May 17, 1960. Excerpts of his address follow.

NEARLY FIFTY YEARS AGO, when the ideals of conservationists — and conservationists themselves — were often the objects of ridicule by uninformed and short-sighted people, a very fortunate meeting occurred in the wilderness country of California. The meeting was fortunate because of it an idea was born, an idea that was to develop, flourish, and eventually result in the National Park System as we know it today.

Ideas presumably do not exist apart from people, and this idea was planted in the mind and heart of a highly successful business man, Stephen Tyng Mather... What his concern for the reservations of wilderness land in the public domain—the National Parks—would come to mean for the nation is but one chapter in the story of a great man.

It is this chapter of Mather's life that I propose to sketch for you, for he was destined to be the father, developer, and first director of the National Park Service.

The idea that "bit" Mather nearly half a century ago resulted from a chance meeting with John Muir, the great naturalist, in the Kern River Canyon wilderness. Mather, a spare-time mountain climber and member of the Sierra Club, was not unaware of the joys and benefits of the "great outdoors" and the already current advice to "See America first." It took the venerable "John of the Mountains," however, to implant in Mather the conviction that he, Stephen Mather, had a personal responsibility, an urgent and unavoidable necessity, to do something for the protection and preservation of the great natural, scenic, and historical heritage that he and all Americans possessed in the areas that were reserved or were yet to be set aside as National Parks.

John Muir's warning of what some of the lumber, mining, and power barons were doing to exploit and ruin the wilderness country, so greatly needed in the very near future as retreats from the dynamic, fast-growing, industrial civilization, touched Mather in a sensitive spot.

Mather, himself a mining king, resolved... that he had to give something back to the nation which had done so much for him. His opportunity lay only two years ahead...

There were a number of National Parks and National Monuments, each reserved by a separate Act of Congress, the day Mather talked to John Muir, and among these Mather dearly loved Yosemite Park.

Three departments of the Federal Government shared administrative responsibilities for these areas—the De-

partments of War, Agriculture, and Interior. Nowhere in Washington was there a single office dedicated to the overall supervision, protection, and development of National Parks.

Yellowstone had been set aside by Congress in 1872 and Yosemite in 1890. Both were administered by the Army for the Secretary of the Interior. Often it seemed that only those who hoped to benefit personally from the resources of these great reserves appeared fully aware of the existence of the National Parks. Few Americans traveled to them until the coming of the automobile, and then literally thousands of cars packed the trails and dirt roads into the Parks. The choking dust seemed almost impenetrable, but Americans were determined to see their Parks. The influx of humanity became a threat in itself to the preservation of the wonders and peace of the National Parks.

As an observer of the problems and already burning with the awareness of personal responsibility, Mather wrote a letter to Washington to express his concern on how these areas were being neglected. The letter received a quick and pointed answer from Secretary of the Interior Franklin K. Lane, who had known Mather thirty years before in California: "Dear Steve. If you don't like the way the National Parks are being run, come on down to Washington and run them yourself."

Mather . . . went to Washington and before he left he agreed to give one year to the National Parks. On January 21, 1915, he was sworn in as Assistant to the Secretary of the Interior for the purpose of creating a National Park Service.

As an educational move, Mather first organized tours of the Parks and the wilderness reserves of the West which he knew. Paying for the expenses in large part out of his own pocket, he personally led groups of industrialists, conservation-minded publishers, philanthropists, and other influential persons on inspection trips into the Sierras. The mountain trips provided dozens of prominent men experiences they would never forget. Six feet one and handsome, even in middle age, Mather was a man of great physical vitality and vigor. Coming upon icy waterfalls from snow-covered watersheds, Mather would leap from his horse, throw off his clothes, and cavort in the "free-shower"—and this he did four or more times a day. Up early in the morning, he would awaken his colleagues to the tune of air whistling out of their air-mattresses and the jarring tom-tom of the camp's cooking pots.

That these field experiences paid off is attested by the fantastically loyal, life-long friendships he made and by the support for National Parks he earned from such influential persons as Gilbert Grosvenor of the National Geographic Society.

Mather had no doubt that he could "sell" Congress on the idea of a National Park Service. How to finance it was another problem. Before Congress could vote funds, there would have to be a public clamor for monetary support of the park idea. Here, again, as on many occasions to come, Mather put up his own money for the job. He also bought the Tioga Road, a privately-owned access road to Yosemite, and tried to give it to the Government. Gifts to the Government, he found, were as popular as gifts to the private accounts of a Federal official—they were thoroughly suspect, and Congress had to pass on the propriety of each gift. After some difficulty, he secured the passage of a law to permit the Secretary of the Interior to accept donations of money or land for park purposes.

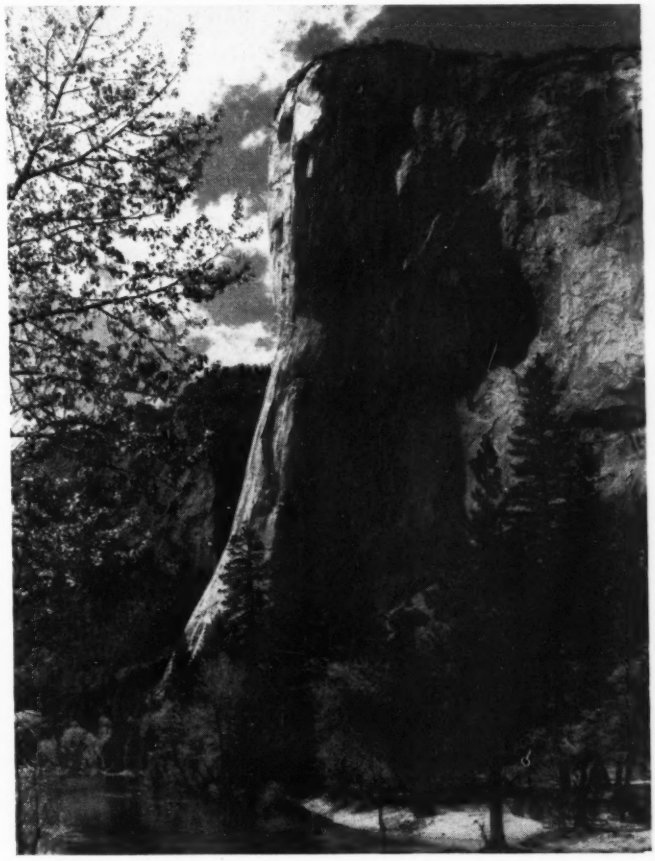
In due course, the Park Service came into being with the signing of the National Park Service Act of August 25, 1916.

Mather had the quality of attracting and enlisting others in his projects—he not only obtained their support, he quickened their enthusiasm. Most remarkable was his enlistment of businessmen in finding the solution to many park problems. He worked out fair contracts for concessioners, which, in his own words, were "... consistent with satisfactory service to the public and a fair return on capital invested, irregularity of seasons, and the otherwise generally hazardous nature of the investment being considered."

In persuading one investor to build a hotel in Yosemite Valley, a sober businessman who drew back in fear of empty rooms and little business, Mather exclaimed, "Look at those cars! There must be close to two hundred. Where's your imagination? Some day there'll be a thousand." Today, hundreds of thousands of cars bring well over a million visitors each year to Yosemite.

In the acceptance of gifts, Mather made possible the preservation of giant sequoias and irreplaceable values in historical and scenic areas. In addition to thousands of small gifts from dedicated people in all walks of life, the National Park Service has been the recipient of substantial portions or whole areas for new parks and of funds for research and development from the National Geographic

Spectacular rock formation in Yosemite National Park.



Society and from the Rockefeller and Mellon families.

With his genius for organization, Mather set the pattern for the National Park Service as it is today—a career service with unusual esprit de corps and an agency perennially above partisan politics.

When he took charge, Mather had under his wing fourteen National Parks and eighteen National Monuments, with a combined area of 7,426 square miles and $254,000 to maintain them. Visitors totaled 335,000. Twelve years later, when he retired, Stephen Mather left a legacy of twenty National Parks and thirty-two National Monuments. These had a combined area of nearly sixteen thousand square miles. Expenditures totaled nearly five million in cash, and authority for the obligation of an additional four millions made up a park program of nine millions. The count of visitors that year was over three millions.

Today, there are twenty-nine National Parks and one hundred and fifty-six National Monuments, battlefields, memorials, and other sites in the System. The combined areas of the Park System is 39,057 square miles; the budget calls for a program of $83,060,000; and the public-use count was 63,000,000 people in 1959.

Ideologically, we still stand in Mather's shadow. It was not Mather's goal to add on to and build up a public-land colossus. He believed that only those areas of truly great scenic, scientific, or historical value and unquestioned national significance should be added to the Park System. We have not yet reached the optimum in preserving for the people what should rightly be theirs.

We are today, as we were in Mather's day—and many park men hail from that golden era—dedicated to making "accessible for a multitude of Americans their heritage of snow-capped mountains, glaciers and streams and falls, of stately forests and quiet meadows."

It was also Mather's genius to recognize the potential worth of the nature walks and guide service of Mr. and Mrs. C. M. Goethe at Lake Tahoe, and just forty years ago this summer [1960], to bring the Goethes and their concept of "indoctrinating young people in the beauty and wonders of their native land" to Yosemite. This interpretive program is now seen in the uniformed ranger naturalists, historians, and archeologists guiding visitors in the National Parks. It is this program that has made the National Parks the world's greatest outdoor school, a fascinating and unique educational institution.

To some men monolithic memorials of granite are raised, and to others long eulogies of unstinted praise are woven. Few men have had the honor, as does Stephen Tyng Mather, of having as his memorial that which belongs to all Americans—the National Park System.

CONSERVATION (from page 7)

hundred and fifty million dollars annually.

A house wren, so it is said, feeds five hundred small worms and spiders to her young during a summer afternoon. This seems a fantastic statement; yet having watched a busy wren flying to and fro from the little wren house in my garden to feed her brood, I can believe it.

If you would enjoy the help of birds in keeping down the insects and weeds in your garden, then you should encourage them by providing the trees and shrubs that they like for shelter and food.

Mrs. Avery Rockefeller prepared a very helpful and attractive leaflet, *Berried Treasure for Your Birds,* for the Conservation Committee of the Garden Club of America. This has had wide distribution. Among the recommended "Plant Materials for Sanctuary" listed in the leaflet are the Japanese white pine (*Pinus parviflora*), an important source of food as well as a place for nesting sites, the flowering dogwood (*Cornus florida*), and the high-bush blueberry (*Vaccinium spp*). The blue-jay, chickadee, gold finch and purple finch, flicker, robin, song sparrow, and thrush eagerly seek the berries of the dogwood and the high-bush blueberry. Some years we have little time in which to enjoy their beauty, so quickly do the birds find these berries. Margaret McKinney in *Birds in the Garden* states that ninety-three kinds of birds like them.

Only two viburnums, *V. opulus* and *V. sieboldii,* are listed under "Additional Suggested Materials" in *Berried Treasure for Your Garden;* however it is stated that the "many varieties make this family first choice for birds and gardeners." I have found that birds like the fruits of several of the native species, *V. acerifolium, V. cassinoides, V. dentatum, V. lentago,* and *V. prunifolium.*

The bayberry (*Myrica pensylvanica*) is another native shrub popular with almost one hundred different kinds of birds because of its waxy grey fruit. These include the bluebird, catbird, chickadee, brown thrasher, downy woodpecker, myrtle warbler, and tree swallow. The snowberry and the coralberry (*Symphoricarpos albus* and *S. orbiculatus*) furnish food for more than thirty species of birds. The beauty-berry (either *Callicarpa americana* or the Japanese *C. dichotoma,* usually listed in catalogs as *C. purpurea*) is relished by the cardinal and the catbird. The cardinal goes after beetles, cutworms, leaf hoppers, and plant lice, while the catbird rids the garden of caterpillars, crickets, and locusts. The cardinal departs promptly when we start to work in the garden. We enjoy his company at a distance —from the windows of our home early in the morning and again late in the afternoon. The catbird is much more friendly. He follows us from one part of the garden to another as we work, or sits on the branch of a nearby tree or shrub, holding conversation with a member of the family who is able to imitate his call.

The hawthorns, particularly *Crataegus oxyacantha, C. arnoldiana,* and *C. crusgalli,* and the flowering crabs, such as *Malus floribunda, M. sargentii,* and *M. sieboldii,* are beautiful ornamental trees for attracting birds, as is the mountain-ash (*Sorbus aucuparia*). The fruits of the flowering Japanese quince (*Chaenomeles lagenaria*) and its varieties are eaten by some birds, and its spiny branches offer refuge.

In winter you should supplement the plant material you have provided the birds with feeding stations filled with seed mixtures and racks of suet and peanut butter. Water, too, is important the year round. In *Berried Treasure for Your Birds,* Mrs. Rockefeller suggests a winter bird bath by placing a plastic bowl in a box, 6″ x 6″ with a socket for a 25-watt light bulb beneath the bowl and attached to an insulated electric cord and weather-proof outlet. The heat from the light bulb will prevent the water in the bowl from freezing. D.E.H.

THE WILD FLOWERS OF THE NEW YORK AREA

By JOSEPH MONACHINO

Mr. Monachino is Associate Custodian of the Herbarium of The New York Botanical Garden.

NEW YORK WAS richly endowed as a natural area by its geographical position, physiography, and geological history. The original native flora must have been superbly varied. Old-timers still recall the orchids that grew at the upper end of Manhattan: *Tipularia, Liparis liliifolia, Goodyera pubescens, Corallorhiza odontorhiza, Spiranthes gracilis,* and *S. cernua.* The pink lady-slipper (*Cypripedium acaule*) flourished at High Bridge and near the approach to the George Washington Bridge in Manhattan. But New York was also highly favored for development into a gigantic metropolis. Steel and concrete assaulted earth and sky; skyscrapers, subways, and thruways blasted away the eternal rock with its mantle of moss and dug out the roots of herbs and trees and all growing things. Yet not all natural life is lost even within the maw of the Empire City, and if the Torrey Range is considered, some superb areas for naturalists still remain.

THE TORREY RANGE

What is the Torrey Range? It is an area of approximately a one-hundred-mile radius around New York City, embracing southern New York from the Catskill Mountains down on both sides of the Hudson River, the entire length of Long Island, all New Jersey and Connecticut, and the fifteen counties of eastern Pennsylvania. A map of the region appears in Norman Taylor's *Flora of the Vicinity of New York.* The range was delimited in 1888 by the Torrey Botanical Club.*

PHYSIOGRAPHY

There is great diversity in topography, soils, and habitats within the sixty-one counties of the Torrey Range, and this has had a great influence on the flora. The mean temperature from the Catskill Mountains to Cape May varies from forty-five to fifty-three degrees, with a difference in growing season of over three months. The geological formations vary from the most recent to the oldest known (but phytogeographically young). Altitudes extend from sea level to 4,204 feet in the Catskill Mountains. There are the Taconics, the Hudson Highlands, the Shawangunks with Mohonk Lake and the Ellenville ice caves in which ice lingers until July; the Appalachian Kittatiny and Blue Mountains; the trap-rock Palisades and the Watchung; and the unglaciated Piedmont Plateau around Hunterdon County, New Jersey. The terminal moraine abuts directly on the coastal plain in Long Island. The Pine Barrens of New Jersey, exposed since Miocene times, are the oldest area in the Torrey Range continuously covered with vegetation. There are spectacular cliffs, ravines, shale ridges, talus and rock slopes, clay bluffs, limestone regions, serpentine barrens, sand dunes, ocean strands and bayside salt beaches, offshore bars like Island Beach in New Jersey, dry hills, old fields, wet meadows, fresh-water and tidal salt-water marshes, tussock swamps, cranberry and sphagnum bogs, rivers, fast- and slow-moving brooks, braided streamlets, lakes (the artificial lakes in the Harriman–Bear Mountain Park follow the natural contours of ancient glacial lakes), ponds, waterfalls veiled below with a cool spray-mist, baked mud flats which crack in irregular polygons, sun-beaten barren summits, woods where the leaf-filtered sunlight casts circular patches of light, and dark dank cedar swamps.

THE VASCULAR PLANTS

For the Torrey Range Norman Taylor listed 2,651 vascular plants (I have counted fifteen hundred within New York city limits), exclusive of casual introductions or waifs, distributed in 172 families and 830 genera. There are vouchers for these records; over sixty-seven thousand specimens are deposited in the Herbarium of The New York Botanical Garden. The largest families are the grasses, sedges, and composites. *Carex* with 155 species (Taylor's count) is more than twice as large as the next two largest genera combined. About half of all the known families of phanerogams or flowering plants are represented in the

* The Torrey Botanical Club, organized about 1866 and incorporated in 1873, is devoted to presenting and discussing original work in botanical research, to disseminating knowledge in plant science, and to inspiring a profound appreciation of our natural heritage. It is named in honor of John Torrey, who in 1819 published *A Catalogue of Plants Growing Spontaneously within Thirty Miles of New York.* From April to November the Torrey Botanical Club conducts field trips, now in their ninety-fourth season, for the study chiefly of botany and other natural subjects, and usually limits its operations within the Torrey Range. A printed field schedule lists the trips for the season. Membership in the Club is open to all, amateur and professional botanist alike, and members are welcome to bring guests to any meeting and field trip.

local range—one-third in The New York Botanical Garden. The larger families, like the legumes, roses, and orchids are quite amply represented. Since flower-structures within families are essentially alike, the local plants — the wild species—could serve, if carefully studied, as an introduction to a basic knowledge of the flora of the world.

Plant Forms in the Torrey Range

Examples of almost all plant forms or characteristics can be observed among the species found in the Torrey Range. The smallest known flowering plant, *Wolffia,* is seen in the lake in Van Cortlandt Park, New York City. The insectivorous pitcher plant (*Sarracenia*), three species of the sundew (*Drosera*), and several of the bladderwort (*Utricularia*) are in the New Jersey Pine Barrens. The parasitic dodder (*Cuscuta*) with its yellowish thread-like stem, the beech-drop (*Epifagus*) suffused with brown madder, and the waxy white ghost-flower (*Monotropa uniflora*) are to be found in The New York Botanical Garden. The ghost-flower or Indian-pipe turns black on injury or drying. Sometimes it is flushed with pink as if glowing with a rosy inner light.

There are ready examples of various morphological features: bulb (star-of-Bethlehem, *Ornithogalum umbellatum*), tuberous moniliform[1] rootstock (groundnut, *Apios americana*); stems that recline and root at the nodes (moneywort, *Lysimachia nummularia*), stems that turn to the left (wild yam, *Dioscorea*) or to the right (morning-glory, *Ipomoea*); stems that climb by cauline tendrils (bur-cucumber, *Sicyos angulatus*), by stipular tendrils (carrion-flower, *Smilax herbacea*), or by means of sensitive petioles (*Clematis*); stems that are square (cup-plant, *Silphium perfoliatum*) or triangular (umbrella-sedge, *Cyperus*). The stem of clearweed (*Pilea*) is translucent; the bark of the submerged stem of the swamp loosestrife (*Decodon*) is spongy-thickened; the pith of the claret-red stem of poke (*Phytolacca*) is wonderfully chambered; the stem of the sleepy catchfly (*Silene antirrhina*) has glutinous bands.

Arrowhead (*Sagittaria latifolia*).

There are opposite, whorled, alternate, entire, and feathery multi-sected leaves; septate[2] and terete[3] in some rushes; connate or united in boneset (*Eupatorium perfoliatum*), peltate or shield-shaped in may-apple (*Podophyllum peltatum*), pellucid-punctate[4] in St. John's-wort (*Hypericum*). The velvety-sheened, white-tesselated leaves of rattlesnake-plantain or *Goodyera* (Mianus Gorge) are probably the most beautiful in the local range. The prickly pear or *Opuntia* (Long Island and New Jersey) is leafless, and it is armed with barbed bristles. The hairs on the leaves of the nettle (*Urtica*) are stinging; on the leaves of the common mullein (*Verbascum*) soft-woolly and branched; and those on the leaves of the hoary tick-trefoil (*Desmodium canescens*) (Woodlawn, Bronx, New York City) so hooked that the leaves stick to one's clothes.

Nearly all the flower forms are represented in the Torrey Range. The hog-peanut (*Amphicarpaea*) has self-pollinating subterranean flowers. The showy fragrant flower of the water-lily (Staten Island and New Jersey) has numerous petals and stamens. The water-starwort (*Callitriche stagnalis*) is without a perianth; the minute male flower consists of only a single stamen and two inconspicuous bractlets. The corolla of *Viola* is papilionaceous, that of *Datura* trumpet-shaped, and either white or purplish. The corolla of *Lobelia cardinalis* (Passaic River, New Jersey) is blood-red, of *Myosotis* sky-blue, of *Cynanchum nigrum* (Pelham, New York) black-maroon, and of *Oenothera* pure yellow.

The fruits are long slender follicles in *Apocynum* and globular loculicidal[5] capsules in *Sisyrinchium.* Those of *Malva* separate into many indehiscent carpels. Medick (*Medicago*) bears spiraled legumes, tick-clover (*Desmodium*) clinging seed-joints or loments, and *Portulaca* capsules called pyxidia which burst open into an upper and lower half. The capsules of *Oxalis* and *Impatiens* are explosive. The achenes in the strawberry (*Fragaria*) lie on a fleshy edible receptacle, while those of the Indian strawberry or *Duchesnea* (Westchester County, New York) lie on a receptacle resembling that of the strawberry but spongy-dry and inedible. The berry-like fruit of *Gaultheria* is a capsule embedded in succulent red sepals that enlarge with age. The two red drupes of *Mitchella repens* are joined together or coalesced, whence the name of two-eyed berry. The heavy-fruited head of the arrow-arum (*Peltandra*) bends over into the mud on a swan-neck-like peduncle; the berries contain a tenacious mucilage. The berry-like fruit of doll's-eyes or *Actaea pachypoda* (Van Cortlandt Park) is china-white; the berry of nightshade (*Solanum nigrum*) is black, of *S. carolinense* yolk-yellow, of *S. dulcamara* red, of pokeweed (*Phytolacca*) dark purple, and of *Ampelopsis brevipedunculata* a most attractive turquoise.

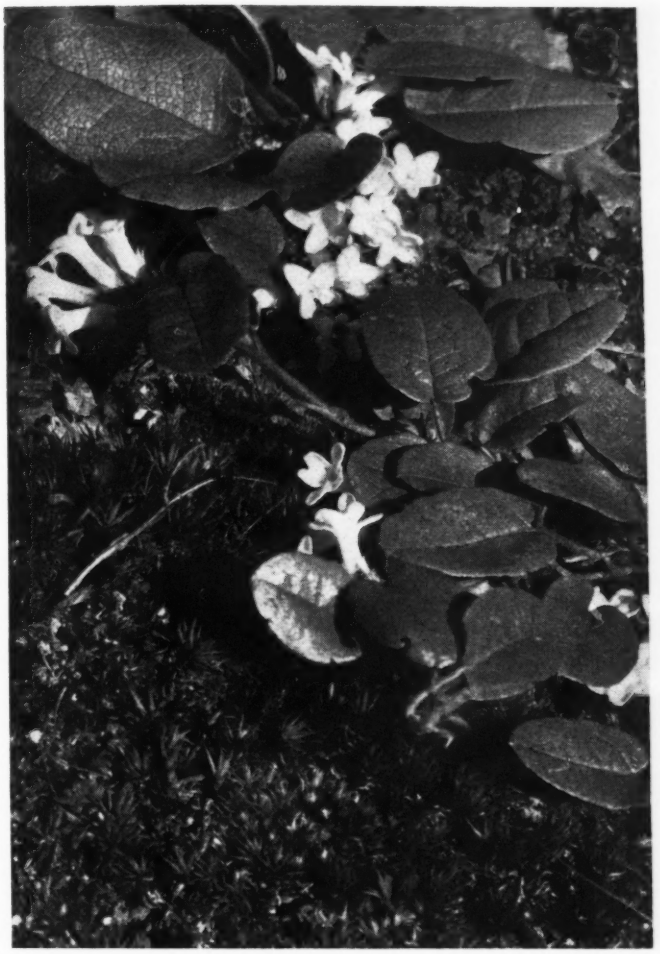
What appear to be blue-black berries on blue cohosh or *Caulophyllum* (Van Cortlandt Park) are truly exposed

seeds. Seeds are as varied as pollen grains: globular or lens-shaped, linear, quadrate or nearly square, winged, appendaged, and variously ornamented. The endosperm is present or absent; the embryo is straight, curved or spiral. The seeds of the celandine or *Chelidonium* (Westchester County) are provided with an aril which is sought by ants. The embryo of *Impatiens* is robin's-egg-blue and tastes like walnut; that of certain pinweeds or *Lechea* (Pelham) is visible through the transparent seed coat.

The New York Botanical Garden

The multitude of plant characteristics noted above—and many more could be added—can be studied in species that are growing wild in the Garden or in nearby localities as indicated. The student need not go far afield to familiarize himself with plant taxonomy. He can locate over one hundred and fifty genera of wild plants in The New York Botanical Garden alone. Some of them are among our most beautiful natives: fawn-lily, spring-beauty, dwarf ginseng, Solomon's plume, jewel-weed, cow-parsnip, lizard's tail, spikenard, stargrass, cynthia, arrowhead, and swamp milkweed. There is a white form of the latter, too.

Many native plants, however, have disappeared. The ragged orchis (*Habenaria lacera*) once grew near Allerton Avenue in the Bronx, the pink lady-slipper in several places in the Hemlock Forest of The New York Botanical Garden. I recall last seeing *Liparis liliifolia* near the old Boulder Bridge about 1940. Trailing arbutus (*Epigaea repens*) grew on a ledge facing the Bronx River, near the South Bridge. One spring day, not very long ago, I went again to visit it—the place was covered with cinders. The wild pink (*Silene*) has expired. The orchids have gone, too, from the rest of the city. Ladies-tresses (*Spiranthes*) are an exception. They show a weed-like propensity. I have seen *S. cernua* on the lawns of homes along busy streets. This very year I chanced upon a small colony of helleborine (*Epipactis*) at the side of a path near the Snuff Mill in the Garden. How it got there is a mystery. But it is not a mystery how *Viola incognita* appeared along a stream in the northern part of the Garden; it was obtained by the violet specialist Ezra Brainerd many years ago for the artist Mary Eaton to draw, and then Miss Eaton planted it! Did *Aster acuminatus,* known nowhere else in New York City, find similar entry? I no longer see *Aster linariifolius* in the Garden. For the past several years I have not found the patch of *Viola rotundifolia* that grew at the side of a path in the Hemlock Forest. I know only a few individual plants of American alumroot or rock-geranium (*Heuchera americana*); these are near a rocky ledge where once an escaped fox made its den. Dutchman's-breeches (*Dicentra cucullaria*) and wood anemone (*Anemone quinquefolia*) are still here, but for how long? There is a white-rayed form of *Aster macrophyllus* on a declivity along the eastern bank of the Bronx River.



Trailing arbutus *(Epigaea repens).*

Introduced Species

The number of species in the Torrey Range has probably increased because of the introductions that have become naturalized. An example of this is the red-spiked *Polygonum cespitosum* var. *longisetum* that has become abundantly naturalized in the Garden and is the most striking wild flower here in November. The tall *Eupatorium* near the Waring Avenue gate is *E. serotinum,* well-fitted to stay in our flora. Near it is *Diplotaxis tenuifolia,* still displaying in November its many bright yellow, comparatively large cruciferous flowers which are well set off from the foliage.

The native plants that may have been completely eliminated from the general Torrey Range must be few up to the present time. It is different in small limited areas such as The New York Botanical Garden, Juniper Swamp (Queens County, Long Island), or Idlewild. I recall wading among yellow fringed orchis in Idlewild and seeing sundews, yellow-eyed grass (*Xyris*), and blazing stars (*Liatris*); but it is likely that for every native species lost, several hardy aliens have invaded meadows, roadsides, and waste places. Numerically there has been a gain—if this is any consolation.

(Continued on page 21)

1. moniliform. Resembling a string of beads; cylindrical, with contractions at regular intervals.

2. septate. Divided by partitions, seen by cutting the leaf longitudinally; or the nodulose septa (partitions) can be felt by squeezing the blade with the fingers.

3. terete. Rounded; having a circular transverse section.

4. pellucid-punctate. Dotted with translucent internal glands, seen when the leaf is examined against the light.

5. loculicidal. Dehiscent or opening naturally into the cavity of the locule or cell through a dorsal suture between the cell-walls.

CONSERVATION PRACTICES GIVE ZEST TO GARDENING

By ARTHUR B. BEAUMONT

Dr. Beaumont was with the Soil Conservation Service for eighteen years—six years in educational work, twelve years in administrative. Previously he spent eighteen years as agronomist with the University of Massachusetts. Since his retirement in February 1957, on reaching the mandatory retirement age, he has served as consultant. Dr. Beaumont, who has also had more than fifty years in practical gardening, is author of *Garden Soils, Their Use and Conservation,* and *Artificial Manures or The Conservation and Use of Organic Matter for Soil Improvement.*

MY RECTANGULAR LOT of one and a half acres lies on sloping land. The average slope is about ten per cent. At one place in the larger vegetable garden plot the slope is eleven per cent. Before conservation practices were initiated, there was some water erosion of unprotected soil. Now that the entire area is under a complete conservation plan, erosion is negligible and productivity is at a high level. Amazing results have been obtained.

I have seven garden plots and three small plots of rhubarb. Of the seven plots, five are used for flowers; the largest plot and one small one are for vegetables. The total area under cultivation is about ten thousand square feet.

On my entire suburban property twenty conservation practices have been established. Of these, fifteen are on or are directly related to the garden plots. I have demonstrated that many of the conservation practices recommended by the Soil Conservation Service for farm land can, with some modification, be applied to suburban home land. The practices established are: 1) Contour planting. 2) Across-the-slope planting. 3) Terracing. 4) Strip cropping. 5) Mulching. 6) Winter cover cropping. 7) Shallow cultivation. 8) Drainage. 9) Water conservation. 10) Irrigation. 11) Use of irregularly shaped areas. 12) Tree windbreak. 13) Permanent grass cover. 14) Summer cover cropping. 15) Composting. 16) Bank protection by vegetal cover. 17) Slope protection by water spreader. 18) Planting trees and shrubs for bird food, cover, and nesting sites. 19) Bird feeder. 20) Bird bath. Only practices on or directly related to gardens will be discussed in this article.

CONTOUR PLANTING is a basic practice in soil and water conservation. In its strict sense it means planting rows on the level; this is necessarily across the slope. Rows so placed tend to hold back the flow of water downhill and, therefore, reduce erosion and increase water absorption. In regions of abundant precipitation it is desirable to allow a slight variation from true level in order to promote drainage. This was the situation with respect to my contour flower bed, which has a grade of one-half of one per cent. This grade is sufficient to cause excess water to run off without washing the soil. Where it is desirable to save all the rainfall, level or exact contours are necessary.

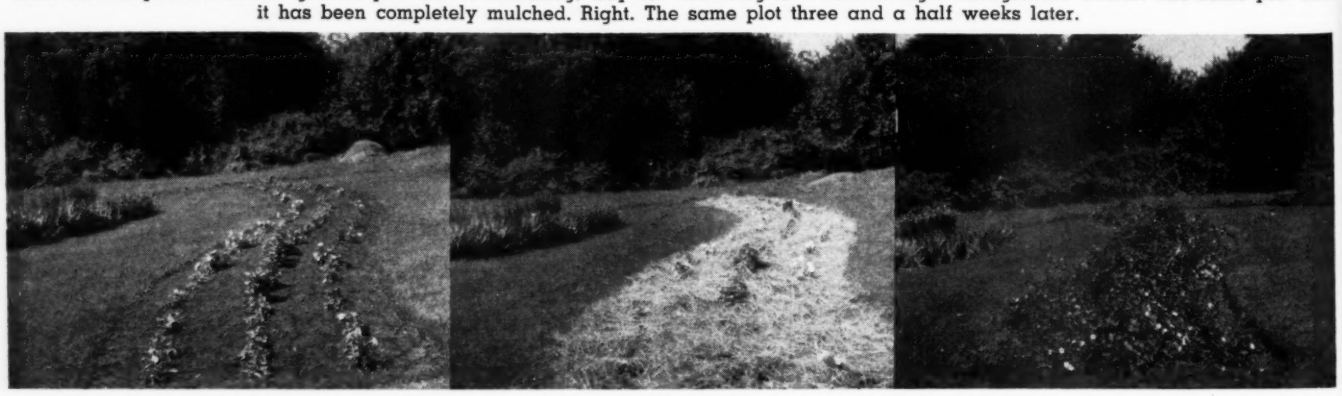
ACROSS THE SLOPE. Where the terrain is so irregular that contour planting is not practicable, or for some reason is not desirable, the next best thing from the standpoint of conservation is to plant straight across the slope. This method is often sufficient for small garden plots, especially if it is supplemented with mulching. Across-the-slope planting is the method used on one of my flower plots, a small vegetable plot, and on part of my large vegetable garden.

A MINIATURE CROPLAND TERRACE runs approximately across the middle of my large vegetable plot. In effect, the terrace divides the plot into two nearly equal ones, thereby reducing the danger of erosion and simplifying the problem. The terrace has a base width of thirty inches and a channel depth of six inches. The channel has a grade of one-half of one per cent, which is sufficient to cause the discharge of water without erosion. It has carried water from heavy downpours. The water is discharged onto permanent grass sod, which prevents erosion. The terrace was built with a hoe, and some rebuilding is necessary each year.

STRIP CROPPING is the growing of tilled crops in strips which alternate with strips of permanent grass or other close-growing vegetation. The strips of grass slow down the rush of water across the tilled strips and strain out any soil that may have been carried from them, thereby reducing erosion and the loss of run-off. When practicable, it is preferable to place the strips on the contour, which is the case in my garden.

MULCHING is one of the simplest and most effective conservation practices for the garden and benefits it in many ways. Mulching will prevent erosion, reduce evaporation of soil moisture, check weed growth, improve the

Left. Contour-planted flower garden plot before mulching; hay for mulching is in cock at right background. Center. The same plot after it has been completely mulched. Right. The same plot three and a half weeks later.



physical condition of the soil, add organic matter to the soil, and, in the case of certain kinds of mulches, add appreciable quantities of plant nutrients. Splash erosion, caused by impact of raindrops on bare soil, the starting point of much erosion, is entirely prevented by a mulch. Splash erosion can be recognized by the presence of soil on flowers and vegetables after a hard rain.

I have used five kinds of mulches, some only for demonstrations. My principal mulch is hay, made from grass cut on land adjacent to the garden plots. This mulch is applied at the rate of eight to ten tons per acre. When freshly applied, it is ten to twelve inches deep, but it finally settles to make a mat one to two inches thick. Eight tons of hay contain about 272 pounds of nitrogen (N), 102 pounds of phosphoric acid (P_2O_5), and 288 pounds of potash (K_2O), in addition to quantities of some other major and minor

In this across-the-slope planting, mulched with hay, are pole beans, strawberries, onions, and tomatoes.

nutrient elements. All these nutrients eventually reach the soil through leaching and decomposition of the mulch, and they account in part for the high state of fertility my soil has attained.

My second most important mulch is hardwood leaves, which are as effective as hay in reducing evaporation of soil moisture and in keeping down weeds. They also carry considerable amounts of plant nutrients. They break down physically when walked upon, not enduring as much walking as does hay. To be effective in suppressing weeds, leaves, as well as other mulches, must be applied abundantly. Hardwood leaves are one of the most practicable mulches for the small garden, because they are generally abundantly available at little or no cost. I use leaves that fall on my own property, and some from my neighbors. They rake them up and give them to me instead of burning them.

I use considerable quantities of pine needles, collected from beneath my windbreak They contain less nutrients than are present in hay or hardwood leaves, and they gradually make a soil acid. But the latter is not a serious disadvantage because soil acidity can easily be corrected by the addition of ground limestone or wood ashes. I use pine needles mainly for mulching strawberry beds, for which they are especially good. I also use some lawn clippings for mulching. They are excellent for this purpose, as they are rich in nutrients and decompose rather quickly. They are in short supply. I have used sawdust and shavings which make good mulches but are practically destitute of plant nutrients. They break down slowly, and on that account are good for improving the physical condition of both heavy and light soils. They are important for increasing the humus content of soils. There are a number of mulching materials on the market such as peat moss, bagasse, and ground corn cobs. Most of these materials are too expensive to use except on a small scale or for a special purpose.

COVER CROPPING is another simple conservation practice for the garden. It gives many of the benefits that result from mulching, but it has limited application to gardens during the growing season. Winter cover cropping is most practicable for gardens. Sown in late summer or early fall, winter cover crops are effective in fall, winter, and early spring. They may be sown between rows of late-maturing crops before harvest. I have used oats and barley for winter cover crops. I prefer them because they winterkill in my latitude, and their residues are easily handled under my system of soil management. I do not plow, spade, or "roto-till".

Sweet corn is being chopped for compost; the compost bin is at right background.

Other crops than oats or barley may be used for winter cover; the choice depends somewhat on the length of the growing season. For northern latitudes, quick-growing small grains are usually best. Winter rye is popular, but it does not winterkill and has to be plowed or spaded under or roto-tilled. In regions of mild winters and long growing seasons, certain legumes, especially clovers, are good winter cover crops. Summer cover cropping is sometimes possible and desirable in gardens. This will be discussed later.

SHALLOW CULTIVATION. Only under exceptional circumstances, and usually incidentally—for example, in planting and digging potatoes—is my soil tilled deeper than two inches; usually not deeper than one inch. Also, because of the application of the mulch early in the season, the number of cultivations is necessarily reduced. Excessive aeration of the soil caused by frequent and deep tillage hastens the destruction of soil organic matter by oxidation. Hence, infrequent, shallow tillage is a conservation prac-

tice. A side advantage is the prevention of root pruning which results from deep tillage. The omission of the mulch early in the season, together with shallow tillage, promotes the warming of the soil by the sun's rays.

DRAINAGE of excess moisture from the soil is only indirectly a conservation practice. Drainage promotes better land use, which is helpful in a conservation program. By increasing productivity of wet land by drainage, erodible, well-drained land may be retired from cultivation.

WATER CONSERVATION and IRRIGATION. In addition to the conservation of soil moisture by mulches and through reduced wind velocity by the presence of a windbreak, rainwater from the roof of a large garage is caught and stored in three large tubs. This water is used in transplanting, for watering plants in dry situations during prolonged dry spells, for moistening compost, and for filling the bird bath. The principal portion of my garden, with deep soil and mulch, can stand a dry period of several weeks without suffering.

USE OF IRREGULARLY SHAPED AREAS. This is a facilitating practice. It makes possible the application of contour planting to an adjacent area. Between contour rows and straight rows across the slope is a triangular area. The most practicable way to plant this area is to a vine crop. I have grown melons in this plot a number of years with varied success. Lately I have used it for growing a small winter squash with great success. The plot is heavily mulched with hay.

TREE WINDBREAK. West and north of the large vegetable plot, across the path of prevailing winds, a pine tree windbreak was planted. It conserves soil moisture by reducing wind velocity, reduces wind damage to crops, and gives protection from cold winds in late autumn and early spring. It also yields an annual crop of pine needles for mulching the garden. To prevent it from cutting off my view of distant hills, the windbreak is pruned each year.

PERMANENT GRASS. Adjacent to all the garden plots is permanent grass. Some of it is kept as a lawn; the remainder is allowed to grow tall for hay. The tall grass, mostly orchard grass, is cut just before seeds mature, made into hay, and used for mulching garden plots. Compost, poultry litter, commercial fertilizer, ground limestone, and wood ashes have been applied to the grass sod as needed to maintain yields. For use as a mulch under my system, it is preferable to mow the grass before it matures seed, which means not later than June 10 in most years.

SUMMER COVER CROP of buckwheat is grown on an area which is being held in a stand-by condition for growing strawberries in rotation. Buckwheat grains are allowed to mature for bird food.

COMPOSTING of waste organic matter is an important adjunct to my gardening. Compost is prepared either in a wooden bin or in open piles. The bin is 5½ feet by 5½ feet by 4¼ feet deep, holds 103 bushels, and has an easily removable side to facilitate removal of the compost. Into the compost go sweet corn stover, surplus or spoiled vegetables, weeds, leaves, garbage, vacuum cleaner sweepings, and so forth. The aerobic-anaerobic, biochemical method of decomposition is used. A little nitrogenous fertilizer, ground limestone or wood ashes are added from time to time to hasten decomposition and fortify the compost. The compost is turned only when it is applied to garden or grass. It takes three or four years to fill up the bin.

Through the application of large amounts of organic matter as compost, mulch, and cover crop, limestone, wood ashes, and a small amount of commercial fertilizer, my soil has become highly fertile and productive. All gains in soil fertility have been held by conservation practices. The soil is in excellent tilth. Examples of yields obtained in recent years, expressed on the acre basis, are: potatoes (early), 800 bushels; onions, 924 bushels; tomatoes (ripe), 27 tons, (green), 7 tons; sweet corn, 26,700 ears.

Right. Contour-planted strawberry bed. Center. Buckwheat-cover crop. Left and rear. Windbreak of pine trees.

Spiritual satisfaction and material gains come from gardening the conservation way. It adds zest to gardening. Even on level land not subject to erosion, conservation gardening is worth while because, in general, practices which conserve soil also improve it.

YEAR-ROUND FLOWER PRODUCTION AT ERDENHEIM FARM

By WILLIAM H. WEBER

Mr. Weber has been at Erdenheim Farm since 1926; for the past twelve years he has been superintendent of grounds and greenhouses. At the Philadelphia Flower Show in the spring of 1960, Erdenheim Farm won the trophy for the "highest degree of horticultural perfection."

HERE AT Erdenheim Farm, in approximately ten thousand square feet of greenhouses, we grow many flowers and pot plants throughout the year. Erdenheim Farm is the home of Mr. and Mrs. George D. Widener. It is situated near the northwest edge of Philadelphia and consists of some forty different buildings, a one-mile training racetrack, a huge indoor tennis court, spacious grazing and farm lands, and acres of gardens and lawns.

As Erdenheim Farm is a private estate, pot plants and cut flowers are not grown according to commercial methods, but are specially cultivated to meet the year-around demands.

One house is devoted to some two thousand carnations, which are grown to provide flowers from October until

July. Since this is a ten-month demand every year, the young plants have to be grown in an unusual way, unlike that of the commercial carnation grower. Cuttings are taken in January and rooted in a bench of builder's gravel. Hormones are used to expedite rooting. When the cuttings have rooted, they are potted in two-and-a-half-inch standard pots and eventually shifted to four-inch pots. Pinching and feeding are done quite regularly, because the plants must stay in these pots until July. At that time the plants that have been flowering are discarded. New soil is brought in, and the young plants are put in the benches. These plants have eight to ten "breaks" and are ready to advance into flower.

We also grow roses successfully. We use plants budded on wild rose stock, known to rose growers as "volunteers"; their rate of growth is phenomenal. Our planting time is early spring. Roses benched in summer from grafted plants must root in the heat, and so do not establish themselves as well as those that are planted in spring and rooted in a much cooler temperature. We start our rose plants at 52° F. at night for at least two weeks and then raise the temperature to 60°-62° at night.

Chrysanthemums are another principal crop at Erdenheim Farm. We grow one hundred and twenty-five varieties of all types, and they provide flowers from September to January. Short days by the black-cloth method bring in the first mums, and the rest follow on their normal blooming dates.

Sweet peas are still grown in the old-fashioned way here, that is, each plant is kept to one stem, for this ensures large blooms and long stems. Two crops are raised. For the first, planted in September for winter flowering, the Spencer varieties are used; for the second crop, planted in November for spring flowering, the Cuthbertson or Zwolonek varieties are used, because they stand the hot weather better than the Spencers.

About a thousand lilies of all kinds are grown annually. *Lilium longiflorum* 'Floridae' or 'George Belle' is planted first for flowering at Christmas and is followed by 'Erabu', 'Croft', 'Estate', and others; and for June-July flowering the Japanese varieties are grown. Lilies can be grown cool (50° F.) or warm (60° F.), or the timing of flowering can be regulated by moving growing plants from a cool house to a warm house. Once the plants are submitted to heat, they cannot be cooled off to retard their flowering. Disruption of bud formation will occur, and that particular crop will be a loss.

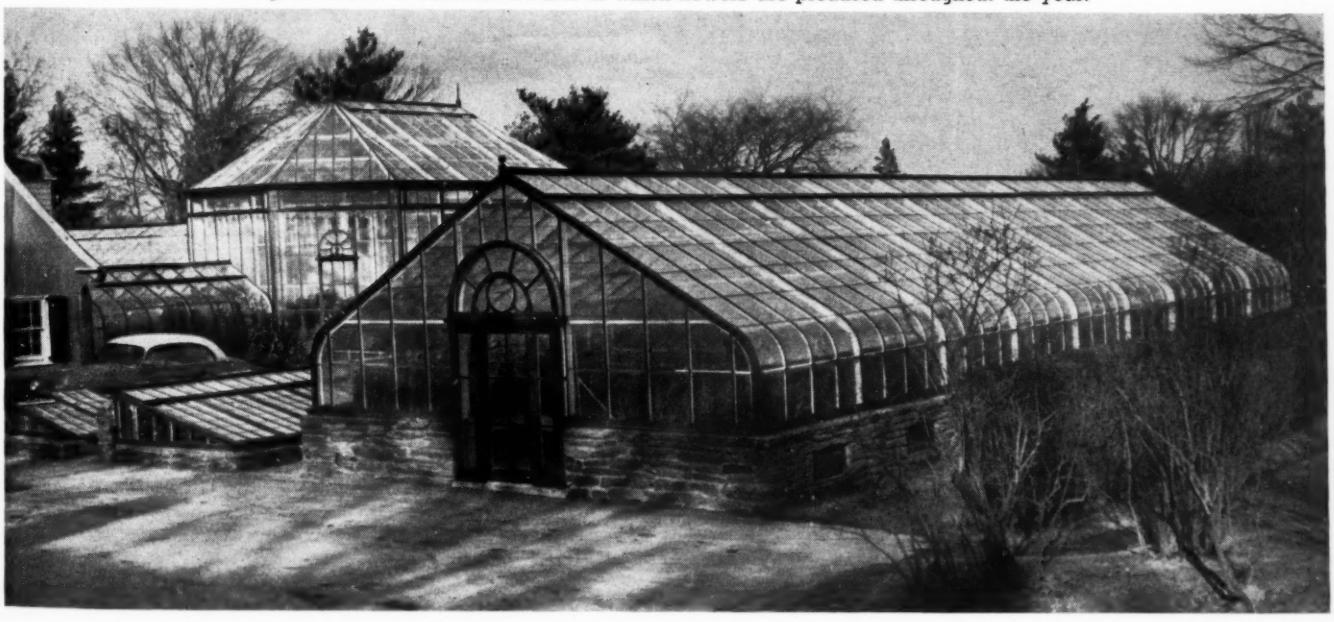
Several crops of snapdragons and stocks are grown each year for a succession of cut flowers, spanning a period from November to June.

In the orchid sections, cymbidiums, calanthes, oncidiums, cypripediums, and phalaenopsis are grown as pot plants and for cut-flower purposes. Calanthes provide cut flowers from November through March; *Oncidium splendidum* for midwinter, and phalaenopsis and cypripediums for sporadic flowering throughout the season. We have recently acquired some of the miniature warm-growing cymbidiums that make delightful small pot plants for flowering around Christmas time. One of these plants carried twenty-six spikes with three hundred and twenty-five flowers. We do not move cymbidium plants outdoors in summer as so many growers do. We believe our success in growing them results from keeping them under glass continually where we have better control of light and humidity.

All the orchids, with the exception of the oncidiums, are fed every two weeks during the growing period with soluble fertilizer and about three or four times during this period with a dry 6-8-4 fertilizer. Various mixtures are used for the potting medium. We still use osmunda for oncidiums and phalaenopsis. For the terrestrial orchids, we use a complex mixture which contains fir bark, peat moss, soil, and sand. Fir bark alone is not very satisfactory, but when combined with peat moss does a good job.

Calla lilies (*Zantedeschia aethiopica* and *Z. elliotiana*) are also major crops in the greenhouses at Erdenheim Farm. Grown in pots, they are fed very heavily throughout the season—from the time the plants are rooted until the growing season is over in May.

The greenhouses at Erdenheim Farm in which flowers are produced throughout the year.



The large-flowered Rutherfordiana and Indica types of azaleas are used exclusively for forcing as pot plants. They are started in fall and forced throughout the season, flowering from Christmas to May.

Nerines for October, cyclamen for midwinter, Rex and Clibran begonias for Christmas, calceolarias, nemesias, schizanthus, and *Clivia miniata* for spring—all are grown for pot-plant and cut-flower work. There is no doubt about it—we do keep the greenhouse benches well filled.

Of the bulbs that are potted in the fall for winter and spring flowering, freesias, tulips, hyacinths, and narcissi head the list. Contrary to most opinions, we find that freesias that are grown in a temperature of 60° F. to flower in January seem to be much better than those grown cooler. Tulips and narcissi are forced for Christmas flowering, as are iris 'Wedgewood' and the new 'White Wedgewood'. All of these bulbs are brought along at various stages through the winter for continuous flowering.

Mr. and Mrs. Widener like gladiolus very much, and as they are not in residence here during the summer when gladiolus flower normally, we grow three "out-of-season" crops. For the first crop, which is planted indoors in January for April-May flowering, prepared corms are used. The second crop is planted in a heated frame in March and brought into flower in June and early July. The corms for September-October flowering are held in storage until their planting time, July first.

Over three hundred hills of fifty varieties of dahlias are grown to provide cut flowers during September and October. Tubers or green plants (which have been started under glass) are set out June first and are disbudded until we let them begin to come into flower about September first. They will continue flowering until killed by frost.

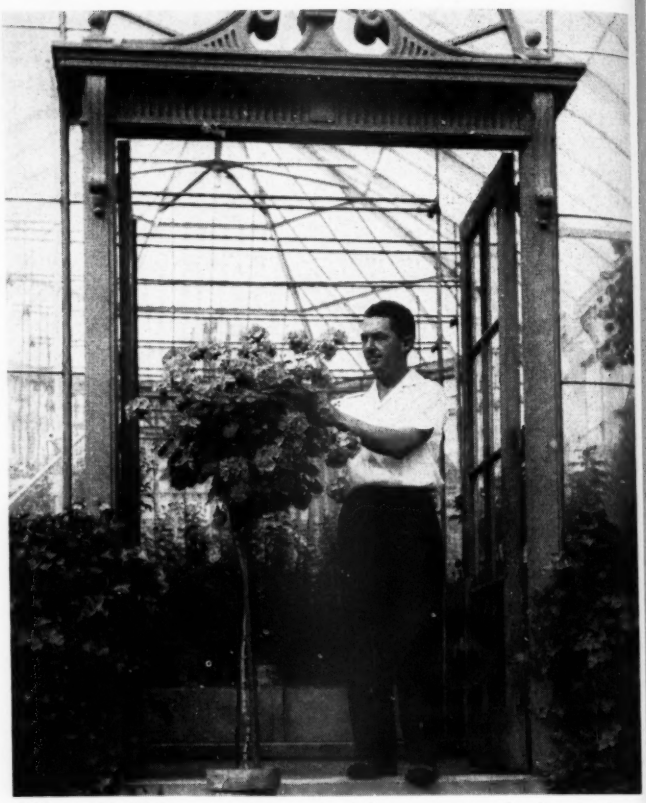
Camellia japonica in several varieties is in demand for cut flowers every winter. Grown in ground beds in one of the large greenhouses, the plants produce a great number of blooms.

Several thousand annuals and perennials are started in the greenhouse every year to meet the requirements of the different gardens in spring and fall. Standard geraniums are always being brought alone for specific needs.

All seeds are sown in pure vermiculite in six-inch pans. Fine seeds are not covered; the larger seeds are covered lightly. After sowing, the pans are immersed to the bottom of the lip in water in which has been dissolved soluble fertilizer — one ounce per gallon—and oxyguinoline benzoate. This provides food to the germinating seeds and prevents damping-off. The pans are then placed in full sun under intermittent misting. The results from this method of starting seeds are very good.

A unique practice at Erdenhein Farm is to sow the seeds of hybrid Pacific delphiniums in August, grow them along slowly in the greenhouse all winter, and transplant them into larger pots as required. When March comes, they are shifted into eight-inch pots and forced in a temperature of 60° F. to flower in April and May. Visitors are always surprised at the sight of our delphinium plants as high as eight feet with flowering spikes more than three feet long.

Almost all the greenhouse crops are grown in a basic soil mixture. Since labor is scarce, and soil requirements are large, we are compelled to make our potting soil in big



William H. Weber examines one of the many standard geraniums grown at Erdenheim Farm.

quantities. We "roto-till" a section of bluegrass pasture to a depth of four inches and spread a good layer of cow manure, limestone, and fertilizer over the roto-tilled area. This is roto-tilled again several times during the year and then transported to a place near the greenhouses. To this basic material peat moss, sand, humus, more limestone, and fertilizer are added. We use this medium for growing almost every plant mentioned in this article. Recently a montmorillic clay, called "Turface," has been tried in place of the sand, but whether the results will be satisfactory has not yet been determined. "Turface," unlike sand, can absorb and adsorb moisture.

A strict sanitation program is carried out. We use poisonous phosphate gas (TEPP) for the general destruction of insects. Safety devices are employed to protect the operator applying the gas. When gassing or bombing is impossible because of weather conditions, we resort to spraying. Malathion we find is a good general-purpose insecticide; "Kelthane" is excellent for mite; "DiThane" is a very good fungicide; and "Slugit" an excellent control for slugs and snails.

By programming we find that it is possible to maintain control of all insects; we do not wait for insects to appear but take the necessary steps to prevent their appearance.

Fertilizing is also programmed. We use dry foods during warm weather. When cool weather sets in, we change to liquid foods because bacterial action is then at a minimum. Every time a section is fed, it is recorded; any "guess" work is thereby eliminated.

Temperatures are also controlled carefully during the winter months. This is most important. The temperature

(Continued on page 21)

FOREST PLANTS ON A CITY HOMESITE

By RAY R. HIRT

Dr. Hirt is Senior Professor Emeritus of Forest Botany of the State University College of Forestry at Syracuse University, New York. He is active in many organizations including the American Phytopathological Society, the National Shade Tree Conference, the American Holly Society, the Men's Garden Clubs.

TWENTY YEARS AGO we decided to purchase a city lot and build a home. After much searching we found a lot that provided a level front lawn, and at the rear a gentle slope leading to an upper level with flat to rolling ground. Adjacent to the rear of the lot was a relatively steep hill covered with native hardwood trees. The lot itself was an open hayfield eighty feet in front, one hundred and twenty-five feet at the back, and four hundred and twenty feet deep. The soil was clay loam underlaid with gravel. Even though the property was in the city, it had characteristics of a rural setting that appealed to us.

I have always been a gardener, particularly interested in vegetables, somewhat so in flowers, and with a desire to create a touch of forest environment about the yard. Thus, there was the challenge to combine my interests in such a way as to have open sunny areas, areas with color, and a few spots and paths in the dense shade of forest trees.

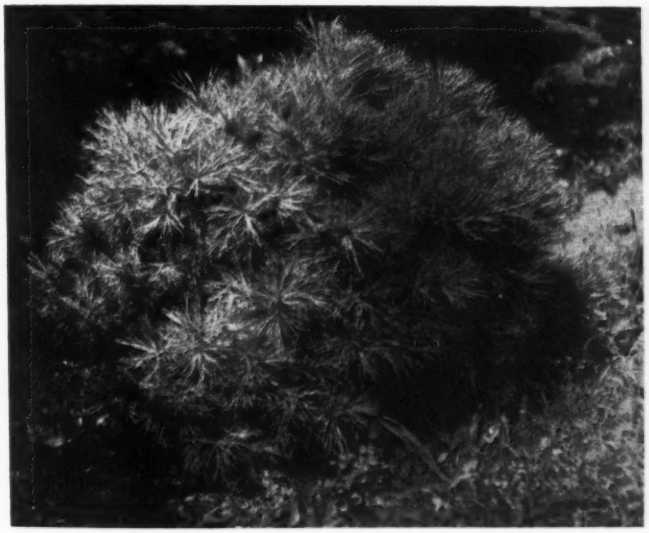
If our planting is unique in any way, I believe it is in the use of forest plants, particularly forest trees, and in the use of a few woody plants not considered to be winter hardy in central New York.

It is not my purpose to discuss the landscape designs of the property—I am a rank amateur at such work—but rather to mention some of the plants I have used, how I have used them, and the results I have obtained.

From the rear of the house to the rear of the lot, the area is screened in by several varieties of coniferous trees planted at the boundary lines. The trees are grouped and consist of white spruce (*Picea glauca*), larch (*Larix laricina*), Douglas-fir (*Pseudotsuga taxifolia*), red pine (*Pinus resinosa*), eastern white pine (*P. strobus*), and northern white cedar (*Thuja occidentalis*). Conifers were chosen because, with proper spacing to avoid deep shade, the branches down to ground level will retain their foliage, and a green screen will be provided throughout the year. Proper pruning once a year has kept the trees sightly and within bounds. Pruning has been done in mid-December, and the greens have been given to neighbors and our church for Christmas decorations. Fertilization of the trees was avoided in order not to stimulate growth. Rapid growth of certain conifers tends to leave considerable space between whorls of branches and makes the trees less attractive.

The "forest" effects were restricted to two small areas. Conifers were used because, on small areas, it is easier to simulate forest conditions with dense evergreens than with open-crown deciduous trees. At the rear of the lot adjacent to a few ash trees already present, four parallel forty-foot rows of trees, eastern white pine and Himalayan pine (*P. excelsa*), were planted. The trees grew rapidly, in part because of partial shade from the ash trees. As the tops closed in, the lower branches died and were removed. The area between two rows of trees was kept clear as a path. The remaining area beneath the trees was planted with various species of native wood ferns. Forest fungi became established in the soil and now appear as colorful mushrooms during the summer and autumn. Later, small eastern hemlocks (*Tsuga canadensis*) were planted adjacent to the last row of pines on the lot side, thus screening the view from the path of anything but trees, ferns, and native wild flowers. The environment is truly that of the coniferous forest.

A similar effect was created by planting a cluster of white



Bristlecone pine, a representative of the oldest trees in North America, is a "conversation piece."

Right. The true dwarf of eastern white pines retains its shape without pruning.

spruce and Japanese larch in a small swale near the west border. White spruce was used because they shape up nicely, bear cones abundantly at a very early age, and have an odor that we like. The trees were planted three feet by three feet and thinned at Christmas time as they became older. About fifty trees have been taken out. Some were given to the neighbors during the holidays, and in recent years large trees have been made available as church Christmas trees. Today, the remaining spruce trees provide a woods-like section for a path along the border.

Eastern hemlock is used in several places as a hedge between small enclosed areas, because this forest tree can be kept dense and held at almost any desired height by careful shearing once a year.

Originally Scots pine (*P. sylvestris*) marked the edge of a path bordering the vegetable garden. However, the trees became too tall, cast too much shade, and kept the lawn beneath cluttered with young cones from midsummer to late autumn. Then, too, on warm humid summer days young branch buds produced an obnoxious penetrating odor, much like decaying flesh. So, the trees were cut down and replaced with Swiss stone pine (*P. cembra*) .

Swiss stone pine grows slowly, remains relatively narrow for many years, has interesting needle structure, and is a nice evergreen even for a small yard. Our trees have withstood several transplantings without ill effects.

A specimen tree that draws comment from visitors is a Jeffrey pine (*Pinus jeffreyi*), native of the Southwest. It has heavy, long dark green needles with a lemon odor. The trunk of the tree is dark-colored and relatively thick in proportion to its height. One young tree under heavy shade remained alive for many years but failed to grow and recently died. The tree in full sun has grown vigorously. When the oldest needles are dropped each year, they are permitted to remain beneath the tree where they slowly decay. This is the only effort of fertilization or soil adjustment to which we have resorted.

Other specimen conifers such as Macedonian pine, Korean white pine, Chinese hard pine, and Japanese red pine are growing on the grounds without special care.

A young "dawn redwood" (*Metasequoia glyptostroboides*), about sixteen feet tall, has grown approximately three feet per year for the last two years. It has withstood temperatures as low as —24° F. without injury. The lower

Swiss stone pine is used to mark a garden path, because it grows slowly and remains narrow for many years.

branches turn upward. The foliage is deciduous, of fine texture, and has an attractive autumn color. The bark naturally splits and peels in an interesting manner. The tree is very easily reproduced by late summer cuttings. It is particularly interesting because, until recently, it was thought to have been extinct some millions of years in the past.

Two bristlecone pines (*P. aristata*) approximately thirty-five years old, now about three feet tall, have been growing nicely in the yard. In the East these pines grow extremely slowly, commonly fail to develop a leader, and thus become a nice evergreen shrub useful for foundation plantings. The needles appear frosty because of resin spots that are normal to the foliage. The plants endure adverse growing conditions which are frequently fatal to other conifers. I suspect heavy fertilization might cause the trees to grow more rapidly and assume a tree form.

In the Adirondacks we discovered a true dwarf eastern white pine. It has no leader but is a ball of fine green foliage. The tree was transferred to our yard many years ago. Now the whole tree forms a green mound about two feet in

Left. This Colorado blue spruce has exceptional year-around color. Center. Jeffrey pine is a native of the California mountains. Right. The dwarf black spruce invariably draws comments from visitors.

diameter and has never been trimmed. Cions from the plant grafted on young stems of seedling white pines form new plants that continue the round compact shape of the parent plant. It is one of our "conversation" plants.

For contrast, deciduous shrubs and trees are used, but these trees are used sparingly. A white birch (*Betula papyrifera*) in front of Douglas-fir is interesting both in summer and winter. In the early spring with the morning sunshine on its mass of yellow male flowers in hanging aments, before leaves appear, the tree is a thing of unusual beauty. Its yellow autumn foliage is most attractive.

Redbud (*Cercis canadensis*) has been a most satisfactory tree. In the spring its mass of pink bloom assures us that cold weather is past. Its heart-shaped foliage is attractive during the summer, and its yellow autumn color is striking. Our tree originated as a seedling in Syracuse, and now its seedlings appear in odd locations in our garden and hedges. Our tree seems to be unusually winter hardy, having experienced our coldest winter weather without any injury other than a reduction in bloom.

Kentucky coffee-tree (*Gymnocladus dioicus*) offers an interesting contrast in size and form of foliage, and autumn color, as well as the rugged branching visible in the winter. However, the tree grows rapidly, becomes very large, and is not a tree for use on a small city lot.

A Korean oak (*Quercus dentata*) is often mistaken for American chestnut because of the shape of its leaves. The leaves are firm, a glossy deep green, and close together on the twigs; thus we frequently use the foliage for greens in flower arrangements, particularly for table settings. This oak holds many of its dead leaves throughout the winter, so that snow and ice accumulate on them and cause some of the branches to break, since the wood is relatively weak.

We have a native spice-bush (*Lindera benzoin*) at the edge of a much-used path because we like to pick an occasional leaf, crush it in our fingers, and enjoy the odor. Our plant is trained into a small tree; however, it can be retained as an interesting shrub.

A small specimen of bladder-nut (*Staphylea trifolia*) draws attention in the late summer and autumn because of its peculiar fruit, a small three-point pod within which the seeds rattle when the pod is nearly mature. Bladder-nut is a native shrub or small tree that grows well in light to heavy shade.

Native flowering dogwood, a severely pruned red maple, an Amur maple (*Acer ginnala*), and a staghorn sumac (*Rhus typhina*) are a few of the plants that add reds to the fall colors. From a golden-chain tree (*Laburnum anagyroides*) we anticipate a shower of yellow spring bloom. The tree seems winter-hardy in protected locations in central New York State.

About fifteen years ago we became interested in growing hollies and since then have tested the winter hardiness in our area of many species and varieties. The winterberry (*Ilex verticillata*) is native to our vicinity on moist soil and in flooded areas. We have found that it also grows well in our relatively dry clay soil, in shade and in sunshine, and fruits abundantly on the pistillate plants. English hollies (*I. aquifolium*) grow well, produce beautiful foliage, but rarely fruit because the flower buds are killed by low winter temperatures. They are in clay loam and naturally mulched by autumn drop of needles from nearby pines. Selections of American holly (*I. opaca*) have now reached a maximum height of ten feet. They fruit abundantly. Their old foliage is cast in the spring as new foliage develops. Most selections show some foliage discoloration in early winter, but there is always ample material for Christmas decorations and sprigs for packages. Each autumn we mulch lightly with pine needles and in the spring add a minor amount of fertilizer and iron chelate.

At this time we have fruits on our native American holly selections, winterberry, *I. pedunculosa, I. ciliospinosa, I. aquifolium donningtonensis,* and *I. platyphylla pallida.*

Several varieties of Japanese holly (*Ilex crenata*) grow well for us. We enjoy the beautiful foliage of *I. crenata convexa* and its sparkling black fruits, but our favorite variety is *helleri* because of its solid mound of dark green leaves. Varieties *microphylla* and *longifolia* frequently display minor winter injury. None of these hollies is given special care.

We have other woody plants, which we like greatly. It has been our plan to have home grounds that we enjoy—open lawn, flower beds, vegetable plot, play area, and woods environment. This we have accomplished without a cluttered effect, probably because we have tucked away many of the plants into inconspicuous nooks, mostly near the property boundaries. We have also made use of small compartments. The grounds are in no sense "park-like" but give a feeling of hominess about which our neighbors and friends remark. Most of this has been accomplished with woody plants of the forest.

FLOWER PRODUCTION (from page 18)

in a greenhouse is not allowed to vary more than two degrees from the specified temperature.

Among the minor crops—yet important in their particular uses—are lemon-verbena for finger bowls, crotons for gaily-colored leaves for fruit dishes, cherry or cocktail tomatoes, rosemary and tarragon for flavoring meat dishes.

Other lesser crops which are grown for specific purposes are double-flowering gerberas, poinsettia (*Euphorbia fulgens,* still often listed as *E. jacquinaeflora*) for Christmas, lily-of-the-valley, centaureas, *Ranunculus asiaticus* or Persian anemone, *Ixia* or corn-lily, *Sparaxis* or wand-flower, *Allium neapolitanum* or flowering onion. Thus, with major and minor crops, the greenhouses at Erdenheim Farm furnish their owners with a diversified and colorful display of plants through most of the year

---

WILD FLOWERS (from page 13)

Much can be done with and for our native flora. The life history and biology of certain species can be profitably studied, as students from Rutgers University are doing in the William L. Hutcheson Memorial Forest (better known as Mettler's Woods). We hope eventually that Taylor's *Flora* will be brought up to date. Its nomenclature can be readily modernized by direct reference to the latest manuals; the many recently introduced species can be interpolated in the keys and text without too much difficulty; and an effort should be made to round-out the county records. The greatest effort should be put forth to save the local floras—this is foremost in importance.

A COUNTRY HOUSEWIFE'S GARDEN

By GERTRUDE B. FOSTER

Mrs. Foster is Editor of *The Herb Grower Magazine.*

WHEN JANUARY'S DAYS of strengthening cold and longer daylight focus attention on the plants before the frosted panes, in our window-sill gardens, there should be one ancient herb among the geraniums and gloxinias. It is the evergreen *Aloe vera,* the herb that has travelled with man on the long war-scarred road from Biblical lands to hospitals in this country where radiation burns are being treated.

The succulent pot plant, too tender to live outdoors except in tropical climates, asks very little of the indoor gardener. It takes a loose, sandy soil with a bit of lime, full sun, and very little watering during the winter. It stands the hot dry atmosphere of heated houses and apartments better than most house plants, and may be set out in the garden in summer. If taken from the pot before it is planted outdoors, the herb will increase by off-shoots or basal buds, which can be removed with a few roots attached to each small fan of leaves, to make many new plants when it is time to lift *A. vera* in the fall. From one plantlet of about five leaves sent to me in an airmail letter from California two years ago I have gained about twenty divisions.

There is no problem about what to do with such bounty. *Aloe vera* has a new role to play in modern life. It is of long repute as a bitter preservative and purgative in ancient times, but the recent research on it as a burn remedy verifies Scandinavian folklore. A plant of the very succulent aloe, which has white spots upon its light green, almost translucent leaves and awl-shaped, dull-pointed spines, used to be a common furnishing of Swedish and Norwegian kitchens. If the housewife burned herself on the wood stove, she reached over to the window sill, snapped off a leaf of the aloe, and painted the wound with the juice which almost ran out of the herb. The "gel," as it is called today, dried without stickiness and seemed to heal the burn without any scar. The healing property in the leaf juice of *Aloe vera* has started a new industry for Florida. Any little plants which are formed by my window-sill pots of this herb make welcome gifts for friends who like to grow their own first-aid herbs.

It takes a bit of digging among the early herbalists to find a frame of reference for the latest discoveries about the aloe. It was widely grown in the Middle East before it became a fairly common plant in our own Deep South. Maude Grieve, author of *A Modern Herbal,* describes the difference between *Aloe vera* and the plant called American aloe, really *Agave americana.* The latter is a plant of the New World and closely resembles the eastern and African aloes but has no medical application. The expressed juice of *Agave americana* is used in Jamaica as a soap substitute, since it lathers as well with salt water as with fresh. The leaves can be used for scouring pans, the decayed spongy substance of their interior serves as tinder where wood is scarce, and the fibers can be spun into thread. Mrs. Grieve mentions that the aloe flowers freely whereas the agave rarely blooms. I have seen pictures of large *Aloe vera* plants in bloom in California, and I await with interest any such exciting developments from the older plants in my greenhouse. Oddly enough, Mrs. Grieve makes no mention of the present-day use of the "gel" taken from the fleshy stems of *Aloe vera.* Species of *Agave* are often seen in window gardens, as the variegated types are valued for their golden markings.

The purgative qualities of *Aloe vera* and other species gave the most dramatic evidence of its medical properties through the ages. Fortunately, few such doses are administered today, but aloe will gain from its older qualities as a vulnerary. The first-century Greek herbalist Dioscorides praised it in these words: "By being sprinkled on drie it conglutinates wounds, & brings to a cicatrix boils, & represseth them. . . .".

In 1597, John Gerard called aloe "Sea Houseleeke". He claimed that if a bit of earth covers the root and it is now and then watered, it can be hung on ceilings and upper posts of dining rooms and, though out of the earth, will remain green. He elaborated on Dioscorides' praise of it and affirmed that it will stay bleeding of fresh wounds, keep hair from falling "if the head be washed therewith: and mixed with wine and honie: it is a remedy for . . . swelling of the gums and all ulcers of the mouth."

Before he discussed "the vertues," Gerard had a word to say about another application: "The herbe is called of the later Herbarists oftentimes Sempervivum, and Sempervivum marianum, bicause it lasteth long after the manner of Houseleeke. It seemeth also that Columella in his 10 booke nameth it Sedum, where he setteth down remedies against the cankerwormes in trees: In English thus

> Liquours of Horehound profit much being powr'd on trees;
> The same effect Sea Houseleeke works as well as thees."

A severe sunburn and inquiring mind led Rodney Stockton, a chemical engineer, to investigate the age-old folklore about the healing properties of *Aloe vera.* When he experienced a bad case of sunburn in Florida in 1945, he heard of the Seminole Indian practice of using the juice of the raw plant to heal incisions made under surgery. Leaving his business in Chicago, he returned to Florida to initiate research on the plant that was a common yard herb there. Now a substantial planting of *Aloe vera* is providing work for farmers, and the Aloe-Creme Laboratories has Government contracts for its products as a result of its success in stabilizing the "gel." Ointment made from it has proved sufficiently active to change a deep thermal burn into a minor first- or second-degree burn within forty-eight hours and to increase healing by fifty per cent, with little scar tissue.

The "gel" is filleted from the leaves of mature plants of *Aloe vera* with great care to avoid contamination with the chemicals in the epidermal layer. The dried juice of the basal portions of the leaves that contained "aloin" was used as a laxative for centuries; this is drained off in making burn remedies and skin creams. Aloe-Creme ointment was used in a study of untreated and treated thermal burns, which was reported in the August, 1959, issue of *Industrial Medicine and Surgery.*

Round-the-World Impressions of Floral Art

By ESTHER WHEELER

Mrs. Wheeler has won many awards for her arrangements, has written and lectured about flower arranging, and is co-author with Mrs. Sam Lasker of *The Complete Book of Flowers and Plants for Interior Decoration.*

WHILE I ANTICIPATED exciting experiences on my recent trip around the world, they went far beyond expectations.

Hawaii is truly a flower-lover's Paradise—the plants are magnificent. Ti leaves (*Draceana terminalis*), white anthuriums, banana blossoms, hibiscus, and crotons were abundant everywhere; octopus tree (*Brassia actinophylla*), red anthuriums, and orchids were used lavishly in stupendous compositions; hundreds of fragrant leis were for sale "to be shipped to the mainland." I was sorry when it was time to leave this glamorous Island. Yet when the plane approached Japan, and I saw the tiny patches of lush green growth through the fog, there was something about them that appealed greatly to me. As I stepped from the plane, I saw that these geometric strips were cultivated right up to the runways.

It was at the entrance to the dining room of the new Imperial Hotel that I had my first sight of a flower arrangement in Japan. This represented a landscape and covered a large round table. Rocks, a little bridge over a stream, a stone lantern, many little dwarf evergreens, and a grouping of white iris buds, all in perfect scale, composed the picture. During my short stay at the hotel, I watched the buds unfold, and gradually the little scene was filled with fully blown iris. The lobby held many arrangements in the modern style, reminiscent of the West, yet with one difference; the principles of receding and advancing rhythm were practiced to show depth.

The term "flower arrangement" is used in a broad sense, since not only flowers but flowerless trees and shrubs are also widely used in Japanese flower arrangements.

Flower arrangement plays an important part in the decor of Japanese rooms. While there are different schools, the basic principles are the same. Every arrangement is made to symbolize "heaven, man, and earth": the main shoot represents heaven; the branch or shoot bent sideways to the right or left denotes man; and the lowest, bent so that it points forward, signifies earth.

May is the month of flowers in Japan, and so our party of twenty-four visited Nikki where azaleas and wisterias in full bloom on the mountain slopes looked like a beautiful floral tapestry.

In Tokyo our group was enthusiastically received at the Ohara Center. There we observed a flower-arrangement class in action; the lesson was on an arrangement in the Nageira style. The students, about one hundred and fifty, stood in front of tables on which their tall containers were placed. They carefully studied each branch of spiraea, fastened them in the vase, and added three peonies. This was the final examination after studying this one style for a month, and they were to be graded on their work. No wonder they were good!

Our next visit to the Sho-fu School, where the "Master" is Mrs. Josui Oshikawa, who lectured and taught in the United States. Mrs. Oshikawa was to have lectured on Rose Day, June 10, 1959, at The New York Botanical Garden, but was prevented from doing so by an accident. Two of her assistants, Mrs. Ginsui Kobayashi and Mrs. Sensui Ide, substituted for her and demonstrated the use of roses in Japanese flower arrangements. They returned to Japan and are now teaching in the Sho-fu School.

(Continued on page 33)

THE TORREY BOTANICAL CLUB HONORS BERNARD OGILVIE DODGE

MORE THAN one hundred and twenty-five members and friends of the Torrey Botanical Club gathered in Philosophy Hall, Columbia University, on October 25, 1960, to honor the late Bernard Ogilvie Dodge, Plant Pathologist Emeritus of The New York Botanical Garden.

Dr. William J. Robbins, Director Emeritus, who was chairman of the program, spoke of Dr. Dodge's ancestors who had settled in New England in the seventeenth and eighteenth centuries; of his father and mother, who had married early and migrated to Wisconsin, and their influence upon him; of his boyhood on his father's farm, and his years as a student and high-school teacher, his identification with Columbia University, his intense enthusiasm and success as a teacher, and his persistence in research. Dr. Robbins said in part:

"Dr. Dodge's concern with fungi as causes of disease extended from plants to animals, including man. From 1928 to 1939, he served as Consultant in Mycology for the Presbyterian Hospital, New York City, and from 1929 to 1960 he was Lecturer in Dermatology for the College of Physicians and Surgeons of New York City.

"For about twenty years he was responsible for the practical control of plant diseases and insect pests at The New York Botanical Garden—the Rose Garden was his special care and delight—and along with this burden pursued research in plant pathology, cytology, and genetics, wrote in cooperation with Dr. H. W. Rickett a text on the diseases of ornamental plants, and played a responsible role in local, national, and international botanical organizations. But Dr. Dodge, like his father before him, was essentially a teacher and nothing pleased him more than to enthuse some beginner or colleague for the subject in which he took so great an interest, and few could resist him. It is impossible to list all those who felt his influence. They include Carl Lindegren, I. R. Hirshkowitz, Myron Backus, S. F. Pady, Jesse Singleton, Esther Zimmer Lederberg, Marjorie Swift, Alice Aronescue, F. Li Tai, Thomas Laskaris, George Bistis, and many others. . . .

"Dr. Dodge's contributions to science were widely recognized in this country and abroad. He was a member of Sigma Xi; a member of the National Academy of Sciences, Fellow of the American Academy of Arts and Sciences, Fellow of the American Association for the Advancement of Science, Foreign Member of the Linnean Society of London, and Honorary Member of the British Mycological Society. He was honored by being chosen a vice-president of the seventh International Botanical Congress at Stockholm, President of the Mycological Society of America, and of the Torrey Botanical Club. When he received the Golden Jubilee Award of Merit of the Botanical Society of America, the citation read:

> "Bernard Ogilvie Dodge, whose perceptive researches into the taxonomy, evolution and pathological relations of the fungi have not been surpassed, but only overshadowed, by his discovery and exploitation of *Neurospora* as a principle of genetical truth."

Dr. P. P. Pirone, who succeeded Dr. Dodge as Plant Pathologist at the Garden, said in part in discussing Dr. Dodge's contribution to plant pathology: "During the nine years with this organization [U.S. Department of Agriculture] he was author and co-author of a number of publications. In my opinion his best plant pathology publications during this period were those dealing with systemic infections of the genus *Rubus* with the orange rusts, published in the *Journal of Agriculture Research*. Even today these are models of outstanding research and lucid writing. . . . Another excellent contribution was the publication, in 1926, with R. B. Wilcox, of U.S.D.A. Farmer's Bulletin 1488 entitled *Diseases of Raspberries and Blackberries*. . . ."

Dr. Dodge's work during nearly twenty years at the Garden included research and observation on diseases of iris, Japanese cherries, roses, geraniums, cedars, marigolds, opuntias, and many other ornamental plants.

Dr. Pirone continued, "I believe that one of Dr. Dodge's greatest and most lasting contributions to plant pathology was the publication, in his seventy-first year, with Dr. Harold William Rickett of a 638-page book on *Diseases and Pests of Ornamental Plants*. . . . This book was well received by scientific workers and professional amateur gardeners throughout the English-speaking world. It was also the standard text on ornamental disease and insect problems in universities offering courses in plant pathology.

"I helped in a slight revision of the book in 1948 and, at Dr. Robbins' suggestion, made an extensive revision with Dr. Rickett's help in 1959. It is my fond hope that over the years this book will serve as a constant memorial to an outstanding scientist and a fine gentleman, Bernard Ogilvie Dodge."

The importance of Dr. Dodge's work for the genetics of fungi was presented by Dr. Lindsay S. Olive of the Department of Botany as a joint contribution by Dr. Francis J. Ryan of the Department of Zoology and himself, both of Columbia University: "'What a remarkable man!' This was the statement so often heard from a new student who had met Dr. Dodge for the first time. As he walked through our Columbia laboratories and saw either of his old favorites, *Ascobolus magnificus* or a new isolate of *Neurospora*, he would shout with pleasure, and everyone on the floor would know he was there. Or, upon seeing an old student or associate strolling through the grounds of the Botanical Garden, he might toss his hat into the air in enthusiastic greeting. Transfixed by a picture of *Pilobolus* in his old stereopticon viewer, he would exclaim to students little more than, 'Oh, boy! Oh, boy!'

"We shall remain transfixed by Dodge's image. He was a kaleidoscope on the scientific scene, a sound and important scientist, motivated by unfailing curiosity, good will, and perennial optimism, a man who has helped bring science in America to a position that does not embarrass us before our colleagues in other parts of the world. Dodge and his favorite organism, *Neurospora*, have had a specific and lasting influence on the course of biological research.

"He had passed the age of forty when his first paper in mycology was published, his last appeared when he was eighty-five. He was fifty-five when his major life's work—the genetics of *Neurospora*—began. What a supreme ex-

(Continued on page 32)

"FLOWER DAYS" AT HEIDELBERG

By HERMAN F. BECKER

Dr. Becker is Visiting Research Associate at The New York Botanical

A VISITOR TO Europe, whether he is professionally interested in plants or is a casual tourist, cannot help being impressed with the accent on flowers and floral displays. Flower shops, in contrast to many of them in the United States, actually sell flowers and flowering plants, not just snake plants, philodendrons, and colored creations of papier maché. Our customary gift-boxes of candy are replaced by the most diversified array of cut flowers and potted plants. The smallest towns and largest cities mirror a natural pride and innate love for flowers, a truly cultural aspect of the less sophisticated world of our ancestors. In France and in Switzerland, in Germany and in the Scandinavian countries, we find not only small and well-kept parks with flower beds, formal or otherwise, but a profusion of blossoms gracing the dividers of streets, surrounding prosaic gasoline pumps, and overflowing the window boxes of houses, public buildings, fountains, statues, and even bridges. In market places on the square and around churches and cathedrals, flowers are the outstanding merchandise of the vendors, whose stalls or carts are laden with a colorful variety. Rich and poor alike buy flowers with their daily purchases. One has the feeling that flowers belong in every home, that they are a necessity to daily life.

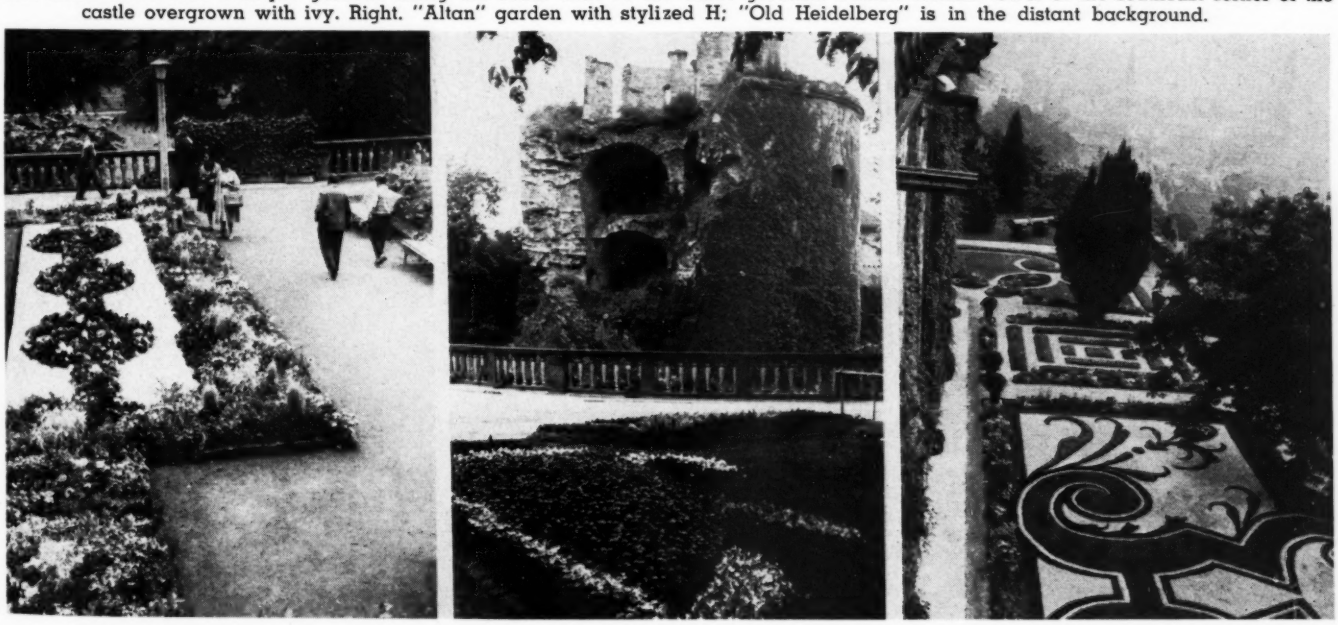
No ordinary photograph can convey their gaiety and esthetic contribution which are perceived by anyone who is susceptible to beauty in nature. Pictures or descriptions cannot do justice to the visual impressions, and even color slides and film are not entirely satisfactory substitutes for the more permanent emotional values evoked by vivid memory. An illustrated book would not suffice to delineate the multitude of imaginative floral presentations; for this reason only one spectacular display is presented here. The "Blumentage" (Flower Days) in Heidelberg, West Germany, may serve as an example of what is to be seen, in varying degrees, in many other towns of Europe.

Formal low border near the flag-lined entrance to the castle gardens.

In the formal beds near the entrance to the castle gardens, a Roman X and "Blumentage" are depicted in red wax begonias on white gravel.

Heidelberg is famous for its university; it is also famous for the ancient castle that dominates the upper part of the city on the left bank of the river Neckar. The castle is nestled in the steep side of a hill (Schlossberg) and is accessible by road, trail, and funicular railway. Within the castle and on its grounds, annual flower displays or "Blumentage" are held in August under the auspices of the city

Left. Renaissance and Baroque gardens along the south wall of the castle grounds. Center. Ancient tower at the southeast corner of the castle overgrown with ivy. Right. "Altan" garden with stylized H; "Old Heidelberg" is in the distant background.



of Heidelberg with the cooperation of flower shops and nurseries in the vicinity. The well-kept castle grounds are eminently suitable for such displays.

The "Flower Days of 1960" were the tenth recurrence of this exhibit and for this reason, perhaps, were particularly lavish and colorful. The week-long anniversary began with the grand opening in the festively decorated royal ballroom of the castle, where exquisite cut flowers and tropical plants were on display. Musical events included a Viennese evening, a Mozart evening, concerts, folksongs and serenades, and the Tonawanda Children's Choir which provided entertainment as guests from the United States. Illuminated flower displays, dancing, fireworks, and a grand illumination of the castle attracted local and foreign visitors alike.

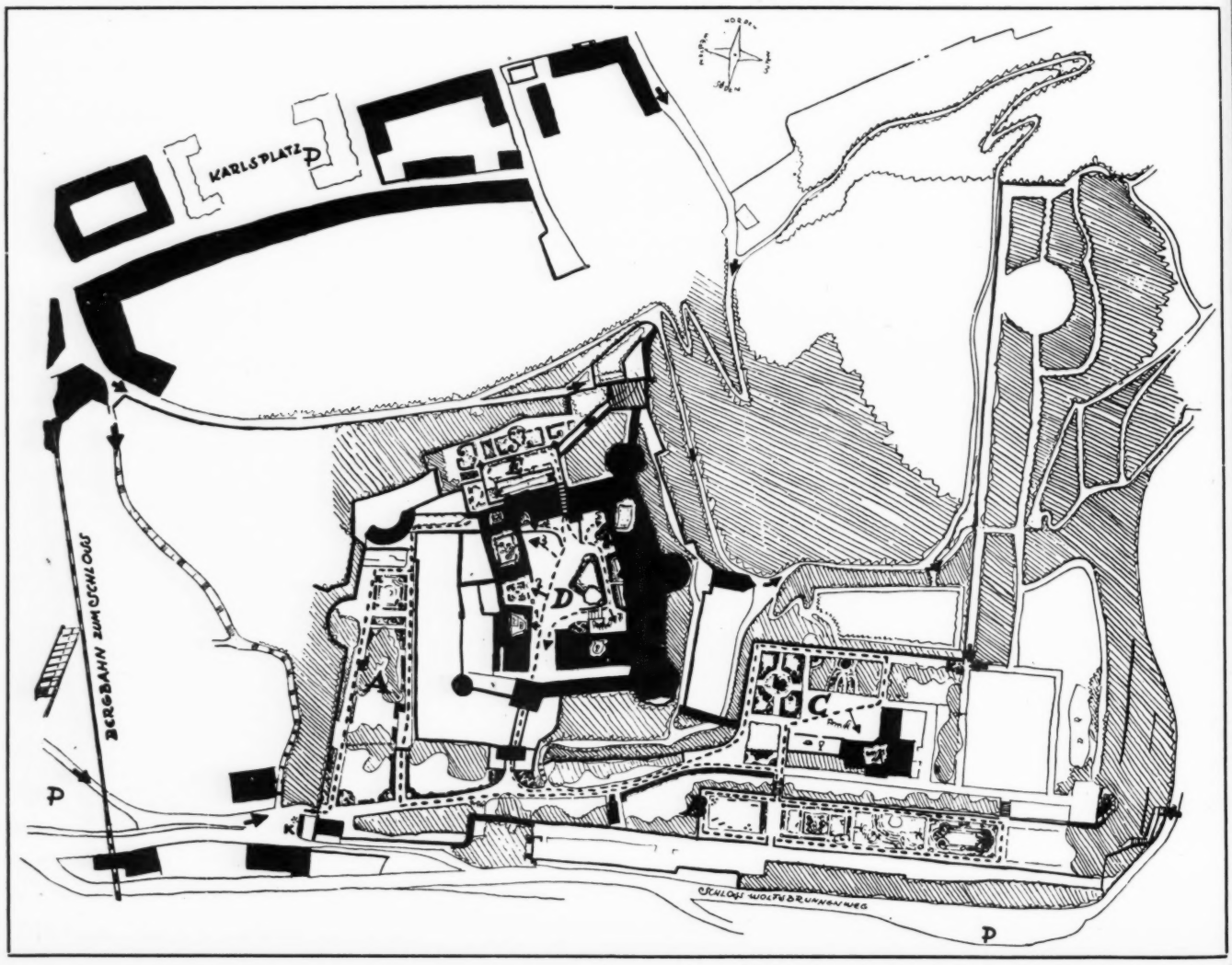
Beginning at the entrance, the wide and well-kept paths were lined with flags from all nations. These greeted the visitors from other lands and made them feel warmly welcome. Gardens within a garden represented features from medieval times, the Renaissance, and the seventeenth century, and there was a partial replica of the ancient "Hortus Palatinus," according to its original creator Salomon de Caux. Another garden duplicated a motif of the early Baroque with strong and rigid forms. Whenever possible the gardens did justice to existing shrubs and trees and, as in the case of some stately redwoods, immeasurably enhanced their effect. A large terrace was transformed into a "bird paradise;" huge cages, camouflaged with reeds, bamboo, and palm fronds, harbored mostly native birds in a somewhat Tahitian or South-Sea atmosphere.

Within the compounds of the castle proper, small formal beds, window boxes, tubs, and jars were effectively arranged to break the monotony of pavement, or to enliven weird old towers, walls, and ruins. The exhibitors succeeded in keeping a modest tone of form and color, never loud or overbearing.

A very impressive view of Heidelberg, the river, and the mountains is obtained from the "Altan," a wide, open gallery or balcony which seems to be suspended above the sprawling city. Below this a long and narrow terrace was devoted to beds of extremely formal construction, depicting landscape design of the climax of the Baroque. As the central motif, the beds culminated in a huge "H" in green and white, symbolizing Heidelberg, and reminiscent of designs at Versailles.

A list of all the plants and flowers that went into the making of the "Blumentage" is not available. Most of them are dwarf, low-growing, profusely flowering annuals and perennials. Some of them are adapted to sunny, some to shady locations; some lend themselves to shearing; and some of them were used en masse. Following are the plants that were most frequently used: ageratum, alyssum, asters, begonias, both tuberous and wax, calendulas, funkias, geraniums, heliotrope, impatiens, iresine, kochia, lobelias, marigolds, petunias, phlox, salvias, snapdragons, stocks, sweet Williams, verbenas, zinnias; also alternanthera, coleus, ivy, pachysandra, and vinca.

Key to the "Blumentage" in the Castle Gardens of Heidelberg.
A. Historical Rose Garden and coat-of-arms.
B. Renaissance and Baroque Historical Gardens.
C. Terrace with "bird paradise."
D. Central Court of Castle with Medieval Gardens.
E. "Altan" with Baroque motif.



BOOK REVIEWS

PALMS OF THE WORLD. McCurrach, James C. 290 pages, illustrated. Harper & Brothers, New York. 1960. $17.50.

For years palm enthusiasts have lacked a book on palms of any comprehensiveness, which would serve for identification and reference. One can find very little material on palms in most libraries. Even persons having access to large botanical libraries have difficulty in finding photographs of certain species, for example, *Teysmannia altifrons;* and the collections of palm photographs, contained in this large, well-illustrated book, are therefore particularly welcome.

There are reasons, of course, why popular palm-identification handbooks have not been published before. First, the general public has not had access to tropical regions and contact with palms, but air-transportation and the growth of Florida and California have made palms as familiar as oaks or maples. Second, it is difficult to compress so much botany into a single volume—and palm botany is particularly difficult, for there is confusion in names and identities. For example, *Rhapis* species are practically unidentifiable, *Thrinax* nomenclature is confused, and in *Phoenix* hybridization is a difficulty. Third, palm material is in many foreign languages. Fourth, assembly of illustrations from all corners of the globe is an expensive project.

The author has drawn on photographs already published in *Gentes Herbarum* for about one-fifth of his illustrations; about one-tenth came from *Palms and Cycads* by William Hertrich; about one-eighth from T. Satake in Japan and ten are from Ethelbert Blatter's book, *Palms of British India and Ceylon.* There are about four hundred photographs in *Palms of the World* as compared with only eighty-five photographs in Alex Hawkes' excellent book, *The Major Kinds of Palms.*

The greatest amount of space is devoted to those genera which are most common or suitable for Florida or California. These are *Sabal, Phoenix, Copernicia, Roystonea, Livistona, Coccothrinax, Pseudophoenix, Veitchia, Erythea,* and *Syagrus.*

About two hundred and thirty-five genera are treated—sixty per cent of them in detail. Of the remaining forty per cent only the country of origin is given. The detailed description of each species systematically follows a uniform pattern under the headings of common-name, origin, sex, trunk, petiole, leaf, leaflets, or segments, flower-stalk, fruit, seed, and oddities. The word spadix is seldom used; flower-stalk is substituted. The descriptions are concise, accurate, and convenient. An illustrated glossary of palm-terms precedes the main text. A section on "Cultivation and Seed-Germination" has been provided for many species; this information was compiled by Florida and California palm growers.

There are some criticisms. The alphabetical arrangement of genera obviates an index, somewhat, but one would have been preferable. The photo of *Deckenia nobilis* is in error, I believe; a sabal-type is shown. *D. nobilis* has a crown-shaft. The sago-palm should have been illustrated. *Pholidostachys* is labelled Malayan instead of Costa Rican.

Certain palms assume a somewhat different appearance when they grow in Florida from that in their native land. For example, *Hyphaene* in Florida never has the multi-branched appearance shown on page 104; the Florida habit would be more useful for identification. *Ceroxylon andicola* never will grow in Florida, whereas copernicas grow wonderfully there, as shown in the illustration of *C. baileyana,* yet are seldom planted in Florida.

Photographs of unusual interest are: the tall *Livistona rotundifolia* with ringed trunks; the even taller *Ceroxylon;* the great *Raphia ruffia* with fifty-foot leaves dwarfing the man below; *Eugeissona tristis* with its numerous thorns; the *Socratea* with ten-foot stilt-roots; the *Leopoldinia* covered with hair from top to bottom; the *Metroxylon amicarum* and its ivory nuts; *Pelagodoxa henryana* and *Teysmannia altifrons* with paddle-leaves which are entire and not segmented.

Many years ago, several books of a popular nature were published in Europe — Seemann, B. C.: *Die Palmen* (1863); de Kerchove, Oswald: *Les Palmiers* (1878); Salomon, Carl: *Die Palmen* (1887), Gatin, C. L.: *Les Palmiers* (1912). These are now out-of-date. Martius' great palm books were subsidized by the German government. The U. S. government could follow such an example.

The present volume is destined to become a standard reference for palm enthusiasts and, I hope, will be expanded in future editions.

R. B. KURTZ
New York, N. Y.

SOIL, GRASS AND CANCER by Andre Voisin. Foreward by H. M. Sinclair and Dr. Allen Fraser. Translated from the French by Catherine T. M. Herriot and Henry Kennedy. Front., 17 ills. (including plates, photos, drawings, charts), 39 tables. Bibliography (18 p.). Index of authors plus subject index. Cl. xvii plus 302 p. Philosophical Library, New York. 1959. $4.20.

As Dr. Fraser so aptly states in his forward "... without a doubt, the health of both animals and men is linked to the mineral balance of the soil."

This book is the preface to a larger work which M. Voisin is preparing for publication, dealing with the influence of the soil on the metabolism of the living cell.

An organism is the biological photograph of the environment in which it lives. But this can only be true if it receives no outside nourishment. In primitive societies man eats the products of his immediate environment. He gathers fruit, grain, vegetables, greens and animal products from a small territory. Today we eat the products grown on a variety of soils in many parts of the world.

To provide a true picture of the effects of local soil conditions, M. Voisin chose grazing animals and Indians living on reservations as subjects for his study.

Although many physicians, nutritionists, animal husbandry men, soil scientists and botanists may not agree with all his statements, he cannot be ignored. This work brings together the interrelationships between the chemical aspects of soils and animal and human nutrition, and their well being. It should stimulate the further study of this vital problem. JOHN ASCH

THE FOREST AND THE SEA. Marston Bates. Random House, New York. 277 pages, indexed. 1960. $3.95.

Every scientist is called upon to review many more books than he can handle properly. The all-too-frequent solution to this problem is to "skim" the book, see if your own work is cited (thus guaranteeing a favorable review), plagiarize the dust jacket, and write a short paragraph. On occasion, a book of vital importance to your own field demands and receives a thorough examination and evaluation. Rarer still is the volume from a biologist which is so enthralling that it is read completely for pure intellectual pleasure. *The Forest and the Sea* is just such a book.

Dr. Bates is now Professor of Zoology at the University of Michigan after a long and distinguished career in public health work. This book, the eighth that he has written or co-authored, is essentially the reflections of a mature biologist with unusually broad experience and considerable facility in writing. It attempts successfully to discuss the interactions of organisms with their biotic and non-biotic environment. Its pertinence to man's activities is forcefully and cleverly pointed out. The "captured" reader, and there will be many of them, is presented with auxiliary reading in an informal Notes and Sources section.

It would be unfair to Dr. Bates to attempt to summarize all of his ideas. These are developed gradually from diverse observations and reflections on a wide variety of organisms and conditions. He has, for example, looked at the environment from the mosquito's point of view —and almost incidentally presented some unsettling thoughts for behavioristic psychologists to ponder. He has presented some provocative ideas on the domestication of plants and animals (including man!). His reasoning for the conservation of natural areas is sound and important. As an individual, I disagree with much of the material in his chapter on the place of man in nature, but his discussion and examples are cogently arranged and his conclusions are logical. Nevetheless, the fact that he made me *want* to discuss it further is the most salutary feature of the book.

RICHARD M. KLEIN

FLORA OF THE LAND OF ISRAEL; Feinbrum, Naomi and Michael Zohari, 15 pages, illustrated. Weizmann Science Press, Jerusalem. 1956. $5.00.

The first two editions in this series (pls. 1-50, and pls. 51-100) appeared as folders containing loose plates. They are now published as books with Hebrew and English texts in each volume. The third volume (pls. 101-150) contains an English text only, arranged according to the alphabetic order of Latin names. The small country of Israel, with an unfavorable climate in many of its regions, yields about two thousand plant species of which fifty are shown in this book. There are five color plates; the remainder comprise excellent drawings in life size of entire plants, floral parts, fruits, and seeds. The choice of plants in this volume appears to be determined by their showiness and frequency of occurrence. The book is, therefore, primarily of value to the casual botanist roaming the barren hills. Additional volumes are in preparation. HERMAN F. BECKER

A Guide for The Haleakala Section [Hawaii National Park]. Ruhle, George C. 100 pages, illustrated. Hawaii Natural History Association, Hawaii National Park, Hawaii. 1959. $1.00.

With special interest focused on our fiftieth State, more visitors than ever will flock to Hawaii National Park this winter to escape inclement weather on the mainland. Dr. George C. Ruhle's *A Guide for the Haleakala Section* of this Park is timely. This booklet, bound in a glossy cover showing the endemic silversword (*Argyroxiphium sandwicense* DC.) in color, devotes fifteen pages to a general introduction to the region with suggested hiking trips; the following thirty-two pages are devoted to Haleakala Hawaiiana, historical background and geology. The next thirty-three pages describe the plants, almost all endemic to the Islands. The remaining eleven pages are devoted to birds, mammals, and insects; and chiefly to Hawaiian words and place names. This Guide, illustrated with photographs and drawings mostly of plants, is indispensable for visitors to this rugged and magnificent region, easily accessible from a comfortable observatory thanks to an auto road that reaches Kolekole Summit at 10,025 feet elevation.

OTTO DEGENER
Waialuo, Oahu, Hawaii

DICTIONARY OF WORD ROOTS AND COMBINING FORMS. Borror, Donald J. 134 pages. N-P Publications, Palo Alto, California. 1960. $2.00.

Dr. Borror, who is Professor in the Department of Zoology and Entomology of Ohio State University, has given us a remarkable compilation of words and fragments of words used in the biological sciences. It is the more unfortunate that the work is pervaded by an unfortunate misconception of the nature of "roots." His "roots" are stems (even botanists have made the same mistake), and this apparently minor technical error leads to a certain amount of confusion. The stem rhachi- is correctly listed (but only the zoological meaning is given), while rhachia-(surf) is also included as "rhachi," as if it were the same word. "Soli," "solo," and "solu" are all listed with the meaning "alone." The last of these I do not know; but the others, and solum also, which might as well have been included, are merely inflectional forms of the same word. Calyx is so given, and the stem calyc-, from which several other words are formed, is not listed; the meaning given is simply "calyx," not the primary meaning of "covering." The two words "carp" (carpo-) are perhaps derived from the same root. And so on, throughout the book.

Errors seem very few ("novaboracens" instead of noveboracensis), and even with the above infelicity of concept the book may be of use to students. But, when all is said and done, would it not be as easy to learn the use of Latin and Greek lexicons?

H. W. RICKETT

BOTANY—A Textbook for Colleges. Popp, Henry W. and Alvin R. Grove Jr. 3rd Ed. 571 pages, illustrated, indexed. McGraw-Hill Book Co., New York, N. Y. 1960. $8.95.

This third edition of a well-known textbook is largely rewritten, rearranged, and even more sumptuously illustrated. Discussions of such topics as growth substances and viruses are expanded, and a more up-to-date system of classification is adopted. The old chapter on "Families of Angiosperms" is omitted. Errors in the treatment of inflorescences and of nomenclature are retained.

H. W. RICKETT

JUST ADD TO WATER, SPRINKLE OR SPRAY!
Sold by Leading Nurseries and Garden Supply Dealers.
NET WEIGHT 5 POUNDS
RA-PID-GRO
In Use Since 1932
Instantly Soluble
The Miracle Plant Food
FEEDS PLANTS 5 WAYS!
ORIGINAL NUTRITIOUS RA-PID-GRO

RA-PID-GRO

The original instantly soluble high-nutrition plant food: Nitrogen 23%, Phosphoric Acid 21%, Potash 17%, plus important trace elements. Made only by RA-PID-GRO Corp., Dansville, N. Y.

PRINCIPLES OF PLANT BREEDING. Allard, R. W. 485 pages, illustrated, indexed. John Wiley & Sons, Inc. New York, N. Y. 1960. $9.00.

This book, by a Professor of Agronomy at Davis, California, is naturally aimed at the student of agriculture. The emphasis is upon methods and results of breeding and selection in crop plants rather than upon principles of heredity as such. However, most aspects of inheritance are treated in considerable technical detail.

H. W. RICKETT

AQUATIC PHYCOMYCETES. Sparrow Jr., Frederick K. 2nd Ed. 1187 pages, illustrated, indexed. University of Michigan Press, Ann Arbor, Mich. July 1960. $22.50.

The second edition of *Aquatic Phycomycetes* is an up-to-date and much-enlarged revision of the book first published in 1943. It is a scholarly presentation of all the microscopic phycomycetous fungi which occur in fresh and marine waters. In addition to the inclusion of species and genera of aquatic phycomyetes described since the first edition, species of *Pythium* and *Phytophthora* that are known to exist in an aquatic habitat, the genera of *Saprolegniaceae*, the desmid parasites belonging to the genus *Ancylistes*, and the species of *Physoderma* parasitic on march and aquatic vascular plants are included.

The book includes technical diagnoses of 10 orders, 24 families, 152 genera and 781 species and is illustrated with 929 line drawings. An index of substrata, a bibliography of over 2500 entries and a general index complete the volume.

CLARK T. ROGERSON

HANDBOOK OF MICROBIOLOGY. Jacobs, Morris B., and Maurice J. Gerstein. 322 pages. D. Van Nostrand Company, Inc., Princeton, N. J. 1960. $8.50.

This text is intended to provide practical information most commonly sought in the course of microbiological laboratory routine and research that ordinarily would require reference to many texts and periodicals. It includes descriptions of culture media, stains, simple keys for identifying the most important microbes, and various tables relating to pathogens, tests, reagents, and numerical data relating to dilution and temperature. This book should be of great value to students as well as professionals.

ANNETTE HERVEY

A GUIDE TO THE IDENTIFICATION OF THE GENERA OF BACTERIA. Skerman, V.B.D. 217 pages, illustrated, indexed. The Williams and Wilkins Company, Baltimore, Md. 1959. $5.50.

The key to the genera of bacteria is based on data given in the seventh edition of Bergey's *Manual of Derminative Bacteriology* and on several original papers. The author hopes that the general application of the methods for study described will lead to a greater uniformity in descriptions at the generic level. Thirty-one

(Continued on page 35)

NEWS, NOTES and COMMENTS

Activities of the Staff and Director. Within recent months, Dr. William C. Steere, Director, attended a meeting of the National Science Foundation in Washington, D. C., to consider awarding grants for research to teachers in colleges and universities on an institutional rather than on an individual basis; the dedication of the new building of *Biological Abstracts* in Philadelphia, at which he spoke on "Communications in Biology"; a meeting of the American Committee of the International Union of Biological Sciences in Washington, D. C.; and the formal organization of the Association of New York State Museums in Albany, New York. Dr. Steere, accompanied by several of the Garden's staff members, visited the Brooklyn Botanic Garden. He also visited the Missouri Botanical Garden, St. Louis, where he discussed botanical problems with the Director, Dr. Frits W. Went, and the Los Angeles State and County Arboretum at the request of the National Science Foundation. He addressed the Northeastern Zone meeting of the Garden Club of America at Millbrook, New York; spoke at the banquet that followed the dedication of the new herbarium facilities at the State Museum, Albany; talked on "Flowering Plants of the Arctic" to the teachers in the In-Service Course under the Garden's Educational Program; participated in a meeting at Tucumán, Argentina, and a field trip to tropical and subtropical areas at the invitation of the Botanical Society of Argentina. from November 27-December 4, 1960, and visited botanical gardens at São Paulo, Rio de Janeiro, and Montevideo.

Dr. Harold W. Rickett, Bibliographer and Acting Assistant Director (Botany), and Dr. F. A. Stafleu of the University of Utrecht have completed work on the list of conserved and rejected names of *Spermatophyta*. The study was begun by Dr. Stafleu several years ago, but it became evident that it was too great a task for one person to do alone, in addition to his regular work. A grant received from the National Science Foundation early in 1958 enabled Dr. Rickett and Dr. Stafleu to spend several weeks that summer in collaboration at the University of Utrecht and in the Botany Department of the British Museum. Dr. Stafleu then visited the United States in December 1958 for further consultation with Dr. Rickett. They completed verification of almost every citation and evaluation of every conservation and rejection, according to the present rules of nomenclature. The results of their work have been published in *Taxon*, Vol. VIII, Nos. 7, 8, 9, and Vol. IX, Nos. 3. 4, 5.

Dr. Rickett went to Utrecht this past summer to confer with Dr. Stafleu on the extensive bibliography. This will be published in *Taxon* in 1961.

T. H. Everett, Assistant Director (Horticulture) and Curator of Education, was informed by the committee in charge of the Eastern Trial Grounds of the American Dahlia Society, which was established at the Garden last year, that it was well satisfied with the maintenance of the Trial Grounds and the number of people who visited it. Forty members of the American Dahlia Society inspected the Trial Grounds on October 9, 1960, and lunched at the Snuff Mill.

Dr. Bassett Maguire, Head Curator and Coordinator of Tropical Research, returned the first week in October from an extended expedition in South America which began in May 1960. He and Mrs. Maguire spent some time in British Guiana, where they left Dr. Stephen S. Tillett, Research Associate, and Mrs. Tillett in the field, and continued their journey to Belém, Brazil. There they joined forces with Dr. Murça Pires, Chief of the Botanical Section at the Instituto Agronômico do Norte, and Dr. Walter Egler, Director of the Museu Goeldi at Belém, and started work on the two-to-three-year exploration of the southernmost part of Guiana. After they were joined by Dr. Howard Irwin, Research Associate, and Lubbert Westra, graduate student, they went into the region of the Oiapogue River, which flows between British and French Guianas. Dr. Irwin and Mr. Westra remained in that region to collect specimens. Dr. and Mrs. Maguire then went to the sandstone region of central Brazil. Their return to the Garden was delayed ten days because of difficulty in getting transportation. Dr. Irwin and Mr. Westra returned to the Garden the middle of November, and Dr. and Mrs. Tillett on Thanksgiving Day.

Dr. Maguire was elected honorary member of the Sociedad Venezolana de Ciencias Naturales, Caracas, Venezuela, on September 21, 1960, because of his extensive explorations, over many years, of the great Roraima-type mountains of the Guayana Highlands.

Dr. Arthur Cronquist, Curator, has completed the index to his book, *Introductory Botany*, which will be published by Harper and Bros. in February or March, 1961. Dr. Cronquist attended a meeting in Washington, D. C., which was concerned with planning the 1961 Summer Institutes for high school students under the sponsorship of the National Science Foundation; and gave a talk on "The Relationship of Evolutionary Mechanisms and Angiosperm Taxonomy" before the Botany Department of the University of Southern Florida on the way back from his plant collecting trip to Costa Rica.

Dr. David J. Rogers, Curator of Economic Botany, conferred with Dr. Edgar Anderson at Wesleyan College, Middletown, Conn., where Dr. Anderson is a fellow in research this year, and spent two days at Harvard University's Botanical Museum. Dr. Rogers has been appointed trustee by Dr. Steere to represent The New York Botanical Garden as a participating member in the Bio-Mathematical Center in New York City. He received acceptance from Prof. Dr. Peter M. Zhukovsky, Director of the Institute of Plant Industry in Leningrad, of the invitation to contribute an article to *Economic Botany*. Dr. Rogers arranged the symposium on "Machine Methods in Biology" in Section G of the meetings of the American Association for the Advancement of Science in New York City, December 26-30, 1960. It was held in the Hotel Biltmore on December 30, and the following presented papers: Dr. Rogers on "Computer Simulation of Taxonomic Methods"; Dr. T. T. Tanimoto, International Business Machines, Research Division, on "Applications—Processing of Non-Numerical Data"; Dr. Robert R. Sokal, University of Kansas, on "Use of Computers in Systematic and Other Zoological Research"; Dr. Leonard Ornstein, Mt. Sinai Hospital, on "Pattern Recognition, Morphology and Generation of Hypothesis." Dr. D. D. Welk of the National Research Council presided at the symposium.

Dr. Richard M. Klein, Alfred H. Caspary Curator, has received a grant of $20,600 from the National Science Foundation for the support of basic research on "Interaction of Ultraviolet and Visible Radiation on Plant Growth." The grant is in effect until October 1963.

Dr. P. P. Pirone, Plant Pathologist, addressed the Northeastern Zone meeting of the Garden Club of America at Millbrook, New York, on "New Chemical Aids to Gardening" and the Northern New Jersey Metropolitan Nurserymen's Association on "Controlling Diseases of Nursery Stock." He is presently engaged in investigating an ailment—a form of leaf scorch—on *Gingko biloba* in New York City. Dr. Pirone recently completed minor revisions on Pirone, Dodge, and Rickett: *Diseases and Pests of Ornamentals*, third edition, to be reprinted by the Ronald Press Company. Published in March 1960, the first printing of the third edition has been sold out.

Dr. Clark T. Rogerson, Curator of the Cryptogamic Herbarium, participated in the Charles Horton Peck annual foray at Paul Smith's College, Paul Smith, New York; also in the symposium on "Botanical Exploration in New York State," held in connection with the dedication of the new herbarium facilities of the State Museum at Albany; spent a week in research at the Highlands Biological Laboratory near Highlands, North Carolina, and collected fungi in the area.

Mrs. Mary Fleming, Technical Assistant in the Cryptogamic Herbarium, lectured before the teachers in the In-Service Course; her subject was "Flowering Plants in the Home Garden." Mrs. Fleming was elected a director of the New York Chapter of the American Rhododendron Society, and Vice-President of the New Jersey Chapter of the Society.

Miss Elizabeth Hall, Sarah Gildersleeve Fife Memorial Librarian, talked on "Flower Prints and Other Illustrations" before the teachers in the In-Service Course at the Garden; visited St. Barnabas Hospital, New York City, where she told patients about some of the amusing telephone calls that come to the Library; was guest at dinner at the Old Ladies Home in the Bronx, where she gave the illustrated talk on "Plants of the Bible."

Dorothy Ebel Hansell, Editor of *The Garden Journal*, attended a breakfast at the Hotel Pierre, New York City, which marked the fiftieth anniversary of the Gilson Manufacturing Co. of Plymouth, Wisconsin, and its entry in the garden tractor field with "Gilson Pacer," a compact, rear-engine model designed by the noted industrial designer Brooks Stevens; a breakfast at the Tavern on the Green in Central Park, New York City, at which "Lawn-Boy Hobby Gardener" and other models of power lawn mowers were shown to representatives of the press, garden writers, and others by OMC Engines and Equipment Division of the Outboard Marine Corp. of Waukegan, Illi-

nois. Moto-Mower Co. of Richmond, Indiana, also entertained a similar group at the Tavern on the Green to whom it showed power lawn mowers, garden tillers, and other power garden tools. Mrs. Hansell attended the fall flower show of the Horticultural Society of New York; the showing of the new film "Magic Carpet of Holland," which will be distributed by the Holland Bulb Growers Association; and the lecture on "Color and Art in Flowers" given by The Garden Club of America at the Metropolitan Museum of Art. She has been appointed a member of the Committee on Publicity for the American Association of Botanic Gardens and Arboretums, of which Dr. William Longenecker, Executive Director of the University of Wisconsin Arboretum and Wildlife Refuge, is the chairman.

Staff Seminars. On October 27, 1960, Dr. Herman Becker, Visiting Research Associate of The New York Botanical Garden, gave an illustrated lecture on the Hebrew University at Jerusalem and the Negev; on November 18, 1960, Dr. Rudolph M. Schuster, Professor of Botany at the University of Massachusetts, discussed "Botanical Investigations in the High Arctic of Greenland and Ellesmere Island."

Gifts to the Garden. John F. Rollins, of Scarsdale, New York, gave a collection of orchids, mostly cattleya hybrids; A. Sumner Gambee of Englewood, New Jersey, a power lawn sweeper; Mrs. Anthony Reinach of Scarsdale, New York, a greenhouse; Earl Morse of New York City, a collection of Saunders tree and herbaceous peonies.

Gifts to the Library. Two volumes of microfilms were received from Mulford Martin, one of a seventeenth-century garden book, *The Twelve Months,* by Matthew Stevenson, the other a modern Russian textbook on plant morphology. A descriptive manuscript on scenes and wildflowers of Australia, entitled "Gardens of Nature," by the late Rev. H. B. Rupp of New South Wales, was presented by his son Arthur through Miss Carol Woodward. Rev. Rupp, who was an honorary member of the staff of the New South Wales National Herbarium, died several months ago at the age of eighty-seven. "Practically all his works and collection are now in the National Herbarium in Sydney," his son informed Miss Woodward. The remainder [is] with the University of New England in Armidale, New South Wales." Rev. Rupp contributed an article to the July 1946 issue of *The Journal of The New York Botanical Garden* on "Something About Australian Orchids," the first of a projected series on the flora of New South Wales.

Dr. George S. Avery, Director, and several members of the staff of the Brooklyn Botanic Garden, Brooklyn, New York, visited The New York Botanical Garden recently, lunched with Dr. Steere and members of the Garden's staff, and discussed matters of mutual interest.

Vincent J. Granger died at his home in New York City on November 26, 1960, at the age of seventy-eight. A native of Dublin, Ireland, he came to the United States about 1910. As a young man he was employed by Charles Broadway Rouss, and it was during these years that he developed life-long interest in geography and botany. His love for plants brought him to The New York Botanical Garden in October, 1940, where he was employed as a helper until 1956. He became Senior Attendant and served as such until his retirement in September, 1959.

He is survived by his daughter Alice and his nephew Edward McGuire, who has been an employee of the Garden for twenty-three years.

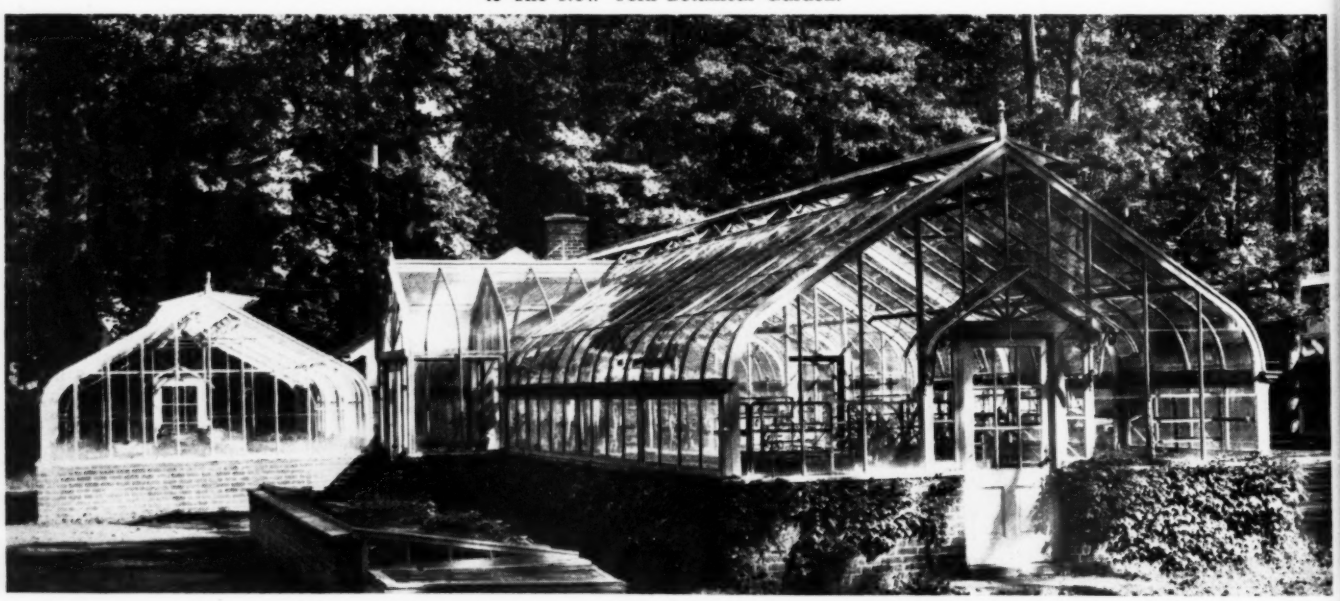
Dr. Stanley A. Cain, Chairman of the Department of Conservation, University of Michigan, has been appointed to a six-year term on the Advisory Board on National Parks, Historic Sites, Buildings, and Monuments by Secretary of the Interior Fred A. Seaton. Dr. Cain is active in the Botanical Society of America, Ecological Society of America, and other organizations. Dr. Cain spent several months at the Garden late in 1940 and early in 1941, in research on a book on ecology which he was preparing under a fellowship from the Guggenheim Foundation.

Visitors to the Garden. Within recent months the following have visited The New York Botanical Garden:

Dr. Maria Buchinger, Dirección de Investigaciones Forestales, Buenos Aires, Argentina.
Mrs. Rose Rabin, Bondi Beach, Sydney, Australia.
Miss Margaret Eadie, Larbart, Scotland.
Otway A. Prevatt, Industrial Development Commission, Trinidad.
Dr. E. G. Melville, Vice-President, Zooological Society, Trinidad.
Dr. and Mrs. E. M. Hildebrand, Chevy Chase, Md.
Dr. Margaret Seikel, Wellesley College, Mass.
Dr. Alexander S. Khokhlov, Institute for the Chemistry of Natural Compounds, Moscow, U.S.S.R.
Dr. S. N. Valenju, Bombay, India, and Vermont.
Drs. Karl Folkers, Carl Hoffman, H. Boyd Woodruff, and A. C. Page, Merck and Co., Rahway, N. J.
Reginald Perry, Enfield, Middlesex, England.
Dr. Dwight Gray, Program Director, and Ileen Stewart, Assistant Program Director, for Support of Scientific Publications, National Science Foundation, Washington, D. C.
Dr. John Flynn, Office of Naval Research, New York, N. Y.
Henry F. du Pont, Winterthur, Del.
Frederick S. Moseley Jr., New York, N. Y.
Mrs. John E. Parsons, Harrison, N. Y.
Dr. John A. Scott, Fieldstone School, Riverdale, New York, N. Y.
Alfred B. Graf, Rutherford, N. J.
Mrs. Harriet L. Morse, New York, N. Y.
Mrs. Mortimer J. Fox, Mt. Kisco, N. Y.
Dr. George M. Lawrence, Director, Rachel McMasters Miller Hunt Botanical Library, Pittsburgh, Pa.
Carl Schiff, Horticulturist, Department of Parks, New York, N. Y.

Citations. Two botanists were among the six people upon whom the American Horticul-

This greenhouse, presented by Mrs. Anthony Reinach, has been dismantled and moved from her property in Scarsdale, New York, to The New York Botanical Garden.

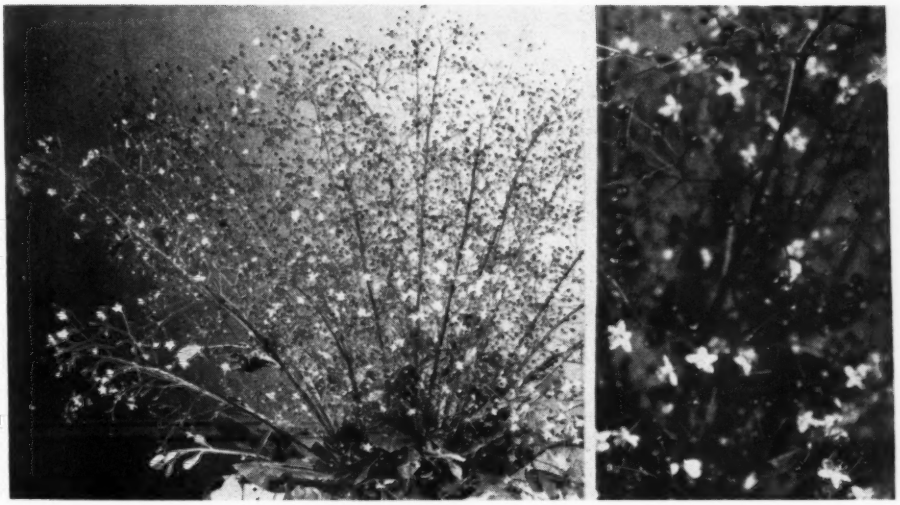


tural Society, at the fifteenth annual American Horticultural Congress held in Pasadena, California, November 1960, conferred citations. These were Dr. Karl Sax of the Arnold Arboretum, Jamaica Plain, Massachusetts, who was honored for his investigations in the genetics and cytology of many important genera of woody plants, and for research that has led to practical applications; and Dr. Philip A. Munz, Director Emeritus of the Rancho Santa Ana Botanic Garden, Claremont, California, who received a citation for his contribution to horticulture in California as a teacher, author, and director of the Botanic Gardens.

The four other recipients were Gretchen Harshbarger, Past President of the Garden Writers Association of America and Midwest Garden Editor of *American Home Magazine*, for her practical garden writings; Jacques Legendre of Gulf Stream Nursery, Wachapreague, Virginia, for his services to American horticulture as plantsman and nurseryman and for his keen perception in recognizing the value and usefulness of new selections from western Europe; William Hertrich, Director Emeritus of the Huntington Botanic Gardens, San Marino, California, for his contributions in stimulating interest in camellias and succulent ornamentals for southern California, and in developing the Botanic Gardens; and Mrs. J. Norman Henry of Gladwyn, Pennsylvania, for collecting and evaluating North American plants and for reporting on their value as ornamentals.

The Liberty Hyde Bailey Medal, awarded for the third time, was presented to Dr. H. Harold Hume of Gainesville, Florida, for his important contributions as a leader in ornamental horticulture in the southeastern states; his publications on hollies, camellias, and azaleas are noteworthy.

"The Fifty States of the U.S.A." will be the theme of the Philadelphia Flower Show to be held at the Trade and Convention Center, March 5-11, 1961. The arts and cultures as well as the natural beauties of the geographical areas of the United States will be featured. Mrs. James C. Hornor is Chairman of the Flower Show Committee, Mrs. H. Cameron Morris is Vice-Chairman.



Talinum paniculatum.

The Federal Trade Commission has received an increasing number of complaints about false advertising of bulbs, shrubs, trees, and other nursery products. Earl W. Kintner, Chairman of the Commission, asserted that "although the great majority of persons engaged in the mail-order nursery industry are honest, responsible business men, the malpractice of a few unscrupulous dealers threatens to give the industry a bad name. In order to protect legitimate nurserymen and the public, the staff of the Federal Trade Commission will subject advertising of nursery products to increased scrutiny. A recent source of trouble for the Commission has been false advertising about the rate of growth, shade afforded, and general attractiveness of the ailanthus or tree of heaven, and about the 'climbing peach vine.' The latter, a relative of the melon, produces a hard gourd-like fruit which is not edible except in preserves. In them it is used like watermelon-rind."

Sherman R. Hill, Director of F T C Bureau of Investigation, suggests that consumers check with Better Business Bureau or other reliable sources on the reputation of an unknown firm which makes exaggerated statements in its advertisements; seek advice from county agricultural agents, horticultural references in libraries, and local nurserymen on whether the particular plant is adapted to the use for which it is advertised; examine carefully claims of "tremendous bargains"; and pay particular attention to advertised guarantees.

Coleus 'Chartreuse'

1961 Plant Offerings. Coleus 'Chartreuse' is being introduced by the Geo. W. Park Seed Co. of Greenwood, South Carolina, as a fine bedding plant in sun or shade and as a nice pot plant in the home during winter. It is a pleasing chartreuse color in early summer and in midsummer and autumn, when grown in full sun, a light golden color. The plant is dwarf and bushy and by a little "topping" may be held to twelve inches or so in height.

Another Park presentation for 1961 is *Talinum paniculatum*. This perennial is not new to horticulture, but it is not generally available. Geo. W. Park's trial-ground planting was so impressive that they deemed *T. paniculatum* worthy of being brought to the attention of gardeners. The foliage is a bright waxy green and forms a nice foil for the airy panicle of flowers borne on stems which rise a foot and a half above the foliage. The small cameo-pink flowers are produced so generously that they create an effect of pink haze. *T. paniculatum* is easily grown from seed; it withstands summer heat, even the moist humid conditions of the Southeast.

Clematis 'Mrs. P.T. James' (plant patent applied for) is one of the new or little-known plants which Wayside Gardens of Mentor, Ohio, will introduce this spring. It is a robust climber with a profusion of large double blue flowers on well-established plants. The pointed petals give the effect of an exploding star. Phlox 'Star Fire' (plant patent applied for) has vivid red flowers and fine green foliage on a plant two to three

Phlox 'Starfire'

feet high. There are from six to a dozen stems on a well-grown specimen. Wayside Gardens are importing several new varieties of phlox, raised by the late Captain Symons-Jeune of England, for introduction to American gardens in 1961; a selection of hardy asters (*A. novi-belgii*) 'Fontaine', 'Lassie', 'The Sexton', and 'Tudor-Rose', which have been developed in England; and they offer the de Rothschild Supreme Selection of azaleas, which they exhibited at the Boston Flower Show last March. The broad-petaled flowers, as much as four inches across, range in color from pure white through delicate pastels to deep yellows, bright orange, and fiery reds.

All-American Mum Selections for 1961 are 'Her Majesty', slightly incurved white decorative; 'Bingo', a dark red cushion; and 'Apricot Sheen', a cactus-flowered cushion mum.

All-American Gladiolus Selections for 1961 are 'Rusty', a Canadian origination and the first All-American "smoky", in color a chocolate-red; 'Gypsy Dancer', a Carl Fischer origination in scarlet-orange with yellow on the lower petals; and 'China Blue', also by Carl Fischer. The color of the last is a soft blue-violet, deeper at the petal tips, then lighter near the center where a deep violet blotch accents the lower petals.

All-American Gladiolus Selections Inc. has forty-six trial gardens in the United States and Canada which test new seedlings from all over the North American continent.

All-America Camellias 1961. All-America Camellia Selections announce two award winners for 1961. *Camellia japonica* 'King's Ransom' has pale pink blooms averaging four and a half inches across; the color deepens rather than fades with age. It is an early-blooming variety. 'Bonnie Marie' bears profusely its four-to-five-inch flowers of a delicate phlox-pink. Early blooms are semi-double; later, more typical ones are anemone-like. This cultivar, the result of a selected clone (*C. saluensis* × *C. cuspidata* × *C. japonica*) has withstood temperatures of 10° below zero, and in the San Francisco, California, area, has bloomed from mid-November through April.

Clements 'Mrs. P. T. James'

A de Rothschild Supreme Selection azalea.

DR. B. O. DODGE (from page 24)

ample for those of us whose faith falters! In 1920 Dodge discovered heterothallism in ascomycetes, using *Ascobolus magnificus*, a new species described by him. In 1927 he started his genetic studies of *Neurospora*, and it was several years before even he fully appreciated the significance of his findings. The new field of study which he opened up had been anticipated in the work of Blakeslee, Burgeff, Knief, and Brunswick, but probably no other investigator in the field carried through with his energy and drive, or can trace in a direct line so much influence on the work of others.

"... After his first papers had demonstrated the excellent potentialities of *Neurospora* for genetic investigations, he took his own counsel and, with the aid of the geneticist Carl Lindegren, showed that *Neurospora* obeyed the basic laws of genetics. Dodge's studies on the heredity of fungi were always adventurous, imaginative, and progressive. Indeed, they were largely responsible for the accelerated adoption of microorganisms as research tools which, with refined techniques devised by Beadle, Tatum, and others, has led to the present-day explosive progress in genetic fact and concept.

"Although Dodge considered himself primarily a mycologist, he was able to move from one field to another and retain his capacity for suspended judgment along with an impulse for progress. Designs in nature—the physics of living things—fascinated him. He would bring in pine cones, snail shells, and plant stems and pore over them for months during his spare time, marvelling at the spiral designs in all of them and making sketch after sketch.

"During each of his latter years, Dodge would bring into our laboratories a set of cultures of *Neurospora tetrasperma*, forgetting that he had done so the year before. He would fondly go over each, giving its origin and characteristics, and then would leave them with us, hoping that some one would be interested in taking up where he left off. Some one will, of course. We are holding them for the use of future students who will be stimulated by his work and the legacy of ideas that he left behind." [Some of Dr. Dodge's cultures are being held at The New York Botanical Garden under the custody of Dr. Annette Hervey.]

Dr. Edward Tatum, Professor at the Rockefeller Institute for Medical Research and a Nobel prize winner, spoke extemporaneously of the significance of Dr. Dodge's research as it applied to biochemical genetics; and Dr. Carl C. Lindedren, of the Department of Microbiology of Southern Illinois University, reminisced about his association with Dr. Lodge.

Dr. Tatum said in part—"Dodge's long career in mycology was characterized throughout by a true love and enthusiasm for his molds. The contributions to which his love and enthusiasm for the fungi led have played a major role in the development of biochemical genetics, although his own researches were not actually in this field. Both as an investigator and as a teacher, his career inspired and will continue to inspire mycologists, microbiologists, and geneticists.

"It is clear from this [a summary of some of Dr. Dodge's work with *Neurospora*] that he was convinced of its versatility and usefulness as a genetic tool, and that he realized fully the basic potentialities of this organism. However, he was well in advance of his time and was almost a lone voice crying in the wilderness for a number of years. . . .Beadle, as a graduate student at Cornell University, heard Dodge lecture on his pet molds. Thomas Hunt Morgan, then at Columbia University, had close contacts with Dodge. He must have been well enough impressed with Dodge's picture of its potentialities to carry a culture of *Neurospora* with him when he moved to the California Institute of Technology in 1928. It was there that Lindegren, on Morgan's advice, undertook his dissertation work on *Neurospora* and studied problems of genetic mechanisms, crossing-over, and related phenomena. As a consequence of the extensive biological and genetic background provided by Dodge and by Lindegren, *Neurospora* was the natural choice for an organism in which to attempt the production of mutations relating to biochemical processes.

"Well before 1941, when Beadle and I undertook our biochemical genetic studies, Dodge had the basic concept and potentialities of *Neuro-*

spora in mind and in many respects his vision permitted him to anticipate later developments. This is shown by the beautifully clear statements in a paper entitled "Some Problems in the Genetics of the Fungi," which was delivered at the Third International Congress in Microbiology in New York in 1939. In this he said: 'The fungi in their reproduction and inheritance follow exactly the same laws that govern these activities in higher plants and animals.'

"...it is not too much to conclude that without Dodge and his vision, insight, and imagination, biochemical genetics via later work with *Neurospora* would not have begun when it did."

FLORAL ART (from page 23)

It was graduation day at the school, and the graduating class had made arrangements of plant material which were placed around the room. The arrangements were simple, but each one had an original slant as, for example, locust seed pods fastened to a vine with three calla lilies massed at the rim of the container.

Kyoto is old Japan; its remarkable heritage of over a thousand years as Japan's imperial capital is still carefully guarded. The gardens are very complex, but nowhere does the art of flower arranging tie in so closely with the art of gardening as it does in Japan. Scale, proportion, unity, and balance are "musts" in both. In the Shugakuin Gardens the art of trimming —a practice followed in flower arranging in Japan as well as in gardening—has reached perfection. I saw hedges of beech trees not more than three feet high, and aged pines trimmed into fantastic shapes. In the Moss Garden there is a remarkable feeling of texture—of velvety texture. No two gardens are similar, nor do they even approach a resemblance to one another; yet all have beautiful proportion and perfect scale and are functional. Green in its many shades and hues is emphasized; there are no disturbing splashes of color.

Shopping in Kyoto was a delightful experience, but old bronze containers and burls which tempt flower arrangers were scarce. The one Seika vase or "usabata" for sale was quickly purchased by a member of our party.

In this city we had the privilege of attending four night classes in Ikenobo College whose origin dates back to the seventh century. We were instructed in the classic style of Ikebana. To my delight I saw a Rikkwa arrangement; it was made by one of the advanced students and was beautiful in every way. The vases for the Rikkwa style do not have double bottoms as do the usabatas; they are open their whole depth to allow considerable lengths of stems to stand in them. The stems are not held together with the forked holders as used in usabatas, but are stuck in rice or straw which is bound into bundles. This particular example of the classic style had been modernized, for it was asymmetrical. Here we learned, too, that "heaven, man, and earth" are a fundamental principle in Japanese flower arrangement which is followed by all schools.

Another great privilege was our visit to the Saga School in the Daikakuji Temple where the present Emperor was enthroned in 1924. We were welcomed by Mrs. Tsujii, wife of the Master, Koshi Tsujii, whom we had met in New York a month earlier. We ate our lunch sitting on tatamis (straw mats) in a room overlooking Owaso Pond. We had already visited many shrines, but this was the only one in which there was a designed flower arrangement. In all the many shrines and temples we visited, the flowers were bunched and tied together and placed on the altars. Occasionally we saw some that had been put in water.

Student priests escorted our party around the mossy gardens and through the abbey which has exquisite accessories; we attended two classes in flower arrangement at the Saga School.

Then came our visit to the famous garden at the Ryoanji Temple, in which sand and rocks are the only elements used to create a picture. No one is permitted to walk in this garden. At first glance it seemed to be no more than a flat expanse of raked sand and groupings of rocks, but further study proved it to be fascinating in conception and execution. The garden is considered perfect in composition and harmony and would be marred, it is thought, if one stone were moved.

Another highlight of our trip to the Orient was a visit to Ito, where we stayed at a pleasant inn, Yonewakso, with a beautiful garden. Although the garden is only a few years old, it has the appearance of having been in existence for centuries. Young spreading pine trees are supported on an elaborate framework of bamboo to train them exactly to the right shape and direction. True scale and proportion give this small garden the feeling of spaciousness, of being much larger than it actually is. Iris, wisterias, and azaleas were blooming at the time of our visit. There was, however, great restraint in the use of plants. Restraint in the use of plants distinguishes their gardens and their arrangements. Restrain is the magic word in Japan, not only in Ikebana and gardening, but in their way of life.

What the future holds for modern Japanese floral art is debatable. Some of the arrangements of the modern school in Japan were fantastic; but they could not have been made without some knowledge of the fundamentals of the classic style, for there was harmony in the whole composition and a relationship between line and container. Where tradition had been cast aside and students given so much freedom that they could not find any more rules to break, the results were extraordinary, as we saw at a flower show in a department store: a few stove pipes put together with a bunch of violets thrust in the hole were one result. In my opinion such "flower arranging" ceases to be art and becomes a craft, and should be separated from true artistic expression, in which plant material is effectively employed. Cut logs, even arranged artfully, do not constitute a flower arrangement.

In Japan both the teacher and student work together to create; this is the impelling force that keeps floral art alive and prevents it from stagnating. Ikebana is more than the art of flower arranging, for it is deeply associated with the philosophy and the way of life of the Japanese, and every arrangement is symbolic. In this country it sometimes seems as though flower arrangers are more concerned about winning "blue ribbons," and where they can use the arrangements in their homes, than they are about artistic expression.

Garden clubs and Ikebana International are thriving in Hong Kong, and they hold competitive shows. Flowers do not bloom abundantly there, because of the scarcity of water, but early spring brings a plentiful supply of calla lilies, peonies, and roses, and these are followed a little later by zinnias.

Thailand is a land of contentment and happiness. In the temples in Bangkok we saw many flower arrangements. Some of them showed an English influence; Queen Victoria, who was intensely interested in this land, sent many gifts of alabaster urns, the decorative flared vases which were used under glass domes and clocks. Fragrant frangipani trees were blooming profusely during our visit, and we noticed marigolds and tuberoses bunched together as floral offerings to Buddha. In the fabulous Siamese home of Jim Thompson, who first set foot in Thailand some fifteen years ago as a colonel in the American Army O.S.S. and is now managing director of the Thai Silk Co., we saw flower arrangements among his art treasures. Many were of rosy pink lotus flowers, whose petals had been incurved by the hands of the English

Five teachers of the Sho-fu School demonstrate Japanese flower arrangement. Mrs. Wheeler, on the left, acts as interpreter. Third and fourth from the left are Mrs. Gensui Kobayashi and Mrs. Sensui Ide, who demonstrated the use of roses in Japanese flower arrangements at The New York Botanical Garden in June, 1959.

hostesses. In the dining room the choice fruits that can be purchased at the floating markets composed a handsome centerpiece. Mr. Thompson's home is a series of old homes furnished with antiques of the Orient. The admission fee is used for the benefits of blind children.

Because of the great heat and lack of rain during the summer months, the growing season around New Delhi and Agra in India is short. However, colorful leis of marigolds were placed around our necks as we stepped off the plane, and little children had gathered wild flowers which they presented to us, saying "Flowers for Madam."

The beauty of the Taj Mahal surpasses anything I have ever seen. Heavy white marble has been transformed into an ethereal edifice—the marble is inlaid with lapis lazuli and carnelian in values of blue and red-orange. The Taj Mahal is situated in a lovely Persian garden where the playing of fountains seemed to cool the air in the intense 112° temperature.

In Istanbul, one of the oldest cities in the world, we came upon the most modern decor—at the Hilton Hotel. Enormous potted hydrangeas decorated the lobby and the terraces, and potted plants of various kinds were hung in marble niches. A beautiful garden, sloping down to the Bosporus, with Asia Minor just across the Straits, was planted with colorful annuals.

Fields of red poppies, asters, and cornflowers in the suburbs of Athens created a memorable picture.

En route to Florence, we drove through farm lands rich in ancient olive trees and grapes. Here again we saw bright red poppies.

In Rotterdam we visited the International Horticultural Exposition. Dr. Carl Wedell, Director General of the "Floriade," who was our host, was assisted by two pretty Dutch girls in blue costumes. I had an overflow audience, not only of adults, but of children for my lecture on Japanese-style flower arrangements.

Mrs. Phillip Young, wife of the American Ambassador to The Netherlands, graciously entertained our group at coffee the next morning at The Hague. This is a beautiful city. White baskets filled with pink geraniums and ivy were strung across the streets in the main shopping areas; the little homes have their tiny gardens; and there are no fences anywhere. Our day was complete with a visit to the Peace Palace and its superb gardens.

Many lessons in the art of gardening and the art of flower arranging are to be learned from many countries. Sometimes these are found in the flower stalls in the midst of cities, sometimes in the fields of wild flowers, sometimes in temples and their gardens.

As a member of The New York Chapter of Ikebana International I participated as an exhibitor at the Ikebana Exhibition held at the Nippon Club in New York City, October 27-29, 1960. This was held under the auspices of the Consulate General of Japan, the New York Chapter of Ikebana International, the Japan Society, the Japanese-American Women's Club, the Nippon Club, and the Oriental Women's Club of New York. The flower arrangements, made by members of the Japanese community of New York and American teachers and students of Ikebana from the metropolitan area, were staged by Genichiro Inoksuma. Mrs. Yoneo Arai, of Greenwich, Conn., a well-known lecturer, gave a demonstration of the Enshu School, Mijiko Mori, a recent graduate of Pratt Institute, and Mrs. T. Uchimura lectured on the Sogetsu School. This is the third Ikebana Exhibition to be held at the Nippon Club. The first two were held in the spring; this one emphasized fall foliage and flowers. The proceeds are turned over to the New York-Tokyo Scholarship Fund.

Appointment to staff. Miss Alice Sircom joined the Garden on December 12 as Staff Associate for Publicity and Promotion. Until recently Miss Sircom was associated with Colonial Williamsburg where since 1954 she had served as a staff writer in the press bureau and public relations department. She had special responsibilities for various annual events including the Antiques Forum, Garden Symposium, and shows at Abby Aldrich Rockefeller Folk Art Collection. Miss Sircom was also a press liaison for visits of Queen Elizabeth II and Prince Philip, Queen Elizabeth the Queen Mother, and heads of other foreign states.

THE NEW YORK BOTANICAL GARDEN

BOARD OF MANAGERS

Officers

CHARLES B. HARDING, *President*
R. GORDON WASSON, *Treasurer*
FREDERICK S. MOSELEY, JR., *Vice-President* MRS. HERMANN G. PLACE, *Vice-President*
HENRY DE LA MONTAGNE, *Secretary*

Elective Managers

(Class of 1960)
GEORGE CHAMPION
HON. THOMAS C. DESMOND
DR. JOHN M. FOGG, JR.
CHARLES B. HARDING
MRS. JOHN E. LOCKWOOD
ALASTAIR MARTIN
HOWARD W. MAXWELL, JR.
HENRY DE LA MONTAGNE
HENRY PARISH, II
R. GORDON WASSON

(Class of 1961)
W. EARLE ANDREWS
SHERMAN BALDWIN
HENRY F. DU PONT
WILLIAM E. HUTTON
REV. LAURENCE J. MCGINLEY, S.J.
MRS. HAROLD I. PRATT
MRS. DAVID ROCKEFELLER
DR. WILLIAM C. STEERE
JOSEPH R. SWAN

(Class of 1962)
MRS. JAMES COX BRADY
DR. LYNDON O. BROWN
LEONARD J. BUCK
MRS. CHARLES BURLINGHAM
GILBERT H. MONTAGUE
FREDERICK S. MOSELEY, JR.
MRS. HERMANN G. PLACE
MRS. JOHN L. SENIOR
CHAUNCEY STILLMAN
OAKLEIGH L. THORNE

Ex-Officio Managers

ROBERT F. WAGNER, *Mayor of the City of New York*
CHARLES H. SILVER, *President of the Board of Education*
NEWBOLD MORRIS, *Commissioner of Parks*

Appointive Managers

By the Torrey Botanical Club: DR. LELA V. BARTON
By Columbia University: DRS. MARSHALL KAY, CHARLES GLEN KING, EDWIN B. MATZKE, FRANK J. POKORNY

THE STAFF

WILLIAM C. STEERE, PH.D., D.E-SCI.	*Director*
ROBERT F. KOLKEBECK, M.B.A.	*Assistant Director (Administration) and Business Manager*
H. W. RICKETT, PH.D.	*Acting Assistant Director (Botany) and Bibliographer*
BASSETT MAGUIRE, PH.D.	*Head Curator and Coordinator of Tropical Research*
ARTHUR CRONQUIST, PH.D.	*Curator*
THOMAS H. EVERETT, N.D.HORT., M.S.	*Assistant Director (Horticulture) and Curator of Education*
RICHARD M. KLEIN, PH.D.	*Alfred H. Caspary Curator*
P. P. PIRONE, PH.D.	*Plant Pathologist*
DAVID J. ROGERS, PH.D.	*Curator of Economic Botany*
CLARK T. ROGERSON, PH.D.	*Curator of Cryptogamic Botany*
E. J. ALEXANDER, B.S.	*Associate Curator*
MARJORIE ANCHEL, PH.D.	*Research Associate*
ALMA BARKSDALE, PH.D.	*Research Associate*
ANNETTE HERVEY, PH.D.	*Research Associate*
HOWARD IRWIN, PH.D.	*Research Associate*
STEPHEN S. TILLETT, PH.D.	*Research Associate*
MRS. MARY FLEMING	*Technical Assistant*
CAROLINE K. ALLEN, PH.D.	*Visiting Research Associate*
HERMAN F. BECKER, PH.D.	*Visiting Research Associate*
DAVID DAVIS, PH.D.	*Visiting Research Associate*
ELIZABETH C. HALL, B.A., M.S.	*Sarah Gildersleeve Fife Research Librarian*
JAMES DALY, B.A.	*Administrative Librarian*
DOROTHY EBEL HANSELL	*Editor of The Garden Journal*
HOWARD W. SWIFT	*Assistant Curator of Education*
ALICE SIRCOM	*Staff Associate (Publicity and Promotion)*
FRANK C. MACKEEVER, B.S.	*Custodian of the Herbarium*
JOSEPH MONACHINO, B.S.	*Associate Custodian of the Herbarium*
VINCENT RAMPINO	*Superintendent of Buildings and Grounds*
LOUIS P. POLITI	*Horticulturist*
ELMER N. MITCHELL	*Photographer*
WILLIAM J. ROBBINS, PH.D., SC.D.	*Director Emeritus*
HENRY DE LA MONTAGNE	*Assistant Director Emeritus*
H. A. GLEASON, PH.D.	*Head Curator Emeritus*
FRED J. SEAVER, PH.D., SC.D.	*Curator Emeritus*
RUPERT C. BARNEBY, B.A.	*Honorary Curator of Western American Botany*
JOSEPH F. BURKE	*Honorary Curator of the Diatomaceae*
EDMUND H. FULLING, PH.D.	*Honorary Curator*
EUGENE JABLONSKI, PH.D.	*Honorary Curator of Tropical Botany*
INEZ M. HARING, B.L., M.A.	*Honorary Curator of Mosses*
ETHEL ANSON S. PECKHAM	*Honorary Curator of the Iris and Narcissus Collections*
OTTO DEGENER, M.S., SC.D.	*Collaborator in Hawaiian Botany*
MRS. WILLIAM PHELPS, JR.	*Collaborator in Venezuelan Botany*

FREE
FLOWER BOOK

If you love flowers, we want you to have a free copy of the new Park Flower Book for 1961.

This catalogue describes over 3,000 varieties of flower seed and plants ... many rare kinds ... all the new ones as well as the older varieties. The book also contains cultural directions, a pronouncing index and germination tables.

Hundreds of actual black and white photographs, and many full-color photographs to show you how the flowers actually look.

Send postcard today for your free copy!

GEORGE W. PARK SEED CO.
GREENWOOD 129, S. C.

Formerly she handled publicity and promotion for radio and television outlets. Miss Sircom is a graduate of the Woman's College of the University of North Carolina.

Forests are Maine's greatest natural resources according to the authors of *Timber Resources of Maine*, Roland H. Ferguson and Franklin R. Longwood. The former is a forester-statistician on the staff of the Northeastern Forest Experiment Station at Upper Darby, Pennsylvania; the latter is a research forester in charge of the Station's research center at Bangor, Maine.

The survey shows that Maine, the "Pine Tree State," now, after three hundred and fifty years of forest use, has eighty-seven per cent of its land-area covered by forests. No other state has so large a proportion of forest land. In terms of pulpwood—raw material for the State's largest industry—Maine's forests contain two hundred five million cords in standing trees.

Of all the timber species found in Maine, spruce is the most abundant. It accounts for twenty-two per cent of the total timber volume; balsam-fir is next most plentiful—about twenty per cent of the total. Hardwoods—among them sugar maple, the oaks, birches, beech, aspen, ash—make up about a third of the total volume. In recent years these species have become more important, as new pulping processes have enabled the pulp mills to utilize hardwoods as well as softwoods.

The outlook for Maine's forests is good, the report states, for these forests are growing more than twice as much wood as is being cut, and they could support a considerable expansion of the wood-using industry. However, there are dark spots in the situation. A larger volume of timber—even more than is cut—is lost every year to insects and diseases, and some is lost to fires.

Since less than one per cent of Maine's commercial forest area is in public ownership, it is on privately owned forest land that improvement in forestry is needed. The report describes the various services and agencies through which private owners of forest land can obtain assistance.

The Timber Resources of Maine contains detailed statistics on forest areas, volumes of sawtimber and pulpwood trees, rate of growth, volumes cut, forest ownership, distribution of the major tree species, and the condition of Maine's forests in relation to the State's economy. Copies of this seventy-five page illustrated report may be obtained from the Forest Commissioner, Maine Forest Service, Augusta, Maine; or from the Director, Northeastern Forest Experiment Station, 102 Motors Avenue, Upper Darby, Pennsylvania.

BOOK REVIEWS (from page 28)

plates, each containing four to six photomicrographs from slide cultures are included as an aid in the interpretation of the keys.

One practical advantage of this book is that it is easily portable.

ANNETTE HERVEY

CHEMICAL AND NATURAL CONTROL OF PESTS. E. R. De Ong. 244 pages, illustrated, indexed. Reinhold Publishing Corp. New York. 1960. $7.50.

This book covers both natural and chemical control of plant and animal pests—an unusual combination. Under the former are included predators, parasites, and diseases of insects. The major part deals with chemical control of insects, diseases, and weeds in field crops, in orchards, vineyards, vegetable crops, and in ornamental plantings, including lawns. The last few chapters describe pests of livestock, household, and stored products, and how to control them.

P. P. PIRONE

VEGETABLE DISEASES AND THEIR CONTROL. Charles Chupp and Arden F. Sherf. 693 pages, indexed, illustrated. The Ronald Press Co., New York. 1960. $12.00.

Thirty-five years after he wrote his first book on vegetable diseases, Charles Chupp, Professor Emeritus at Cornell University, and a world authority on the subject, has written, with the help of Prof. Arden Sherf, another outstanding book. This book is accurate, up-to-date, and practical. It will be useful to backyard gardeners and commercial vegetable growers, as well as to faculty members and students interested in vegetable diseases. The selected references listed after each section should be especially helpful to the latter. About 170 photographs and drawings further enhance the book's value.

P. P. PIRONE

BIOLOGICAL AND CHEMICAL CONTROL OF PLANT AND ANIMAL PESTS. L. P. Reitz, Ed. 273 pages, illustrated, indexed. Publ. 61. Am. Assoc. Advancement of Science. Washington, D. C. 1960. $5.75.

Nineteen American scientists presented papers on biological and chemical control of animal pests at the December 1957 meeting of the American Association for the Advancement of Science in Indianapolis. These are placed under three categories: the public's stake in pest control, recent advances in chemical control, and biological control of pests. The book is too technical for amateur gardeners, but satisfactory for teachers and graduate students in the several fields that are treated.

P. P. PIRONE

METHODS OF BIOCHEMICAL ANALYSIS, Vol. 8. D. Glick, Ed. Interscience Publishers Inc., New York. ix—400 pp. 1960. $10.00.

As biological sciences advance, the needs of investigators for precise tools to probe cell structure and function become more acute.

For more and better plants from cuttings . . .

Try the simple "Rootone Dip!"

New, improved Rootone now contains indole butyric acid that adds new rooting power to its already effective formula. Use Rootone for softwood, hardwood or summer cuttings. Rootone with fungicide added helps prevent "damping off" and other soil-borne diseases. ¼-oz. packet 35c; 2-oz. jar $1.25.

AMCHEM **ROOTONE**

AMCHEM PRODUCTS, INC.
(Formerly American Chemical Paint Co.)
Niles, Calif. • AMBLER, PA. • St. Joseph, Mo.
Rootone and Amchem are registered trademarks of Amchem Products, Inc.

THE HOME OF RARE TREES
Hardy Cedar of Lebanon — 3-4' $14.00
One of the Most Picturesque Evergreens
Dwarf Balsam Fir — 10" $18.00
Globe Blue Spruce — 10" $18.00
Rare Evergreens for Bonsai
BRIMFIELD GARDENS NURSERY
245 Brimfield Road Wethersfield, Conn.

During the last decade, the use of physical and chemical techniques have become the rule in virtually all research laboratories. In addition to the expense of such equipment (a factor in the accelerated aging of administrators) the methodology and techniques required to exploit these exciting new concepts are difficult to obtain. Biologists are particularly prone to such problems because it has become increasingly difficult to keep abreast of concepts and results, much less the experimental innovations and technical methods needed for the research.

For these reasons, the initiation of a series of "how to" volumes is particularly welcome. Prof. David Glick of the University of Minnesota, a pioneer in biochemical and biophysical analysis, has assumed the awesome responsibility of editing a review periodical. The series has contained authoritative articles on microbiological, physical, chemical, and bioassays for a wide range of biologically important cell constituents. "Do it yourself" papers on instrumentation and laboratory procedures round out the selection. The present volume, dealing with fatty acids, hormones, porphyrins, and other substances, will undoubtedly be as welcome and as useful as are the previous volumes.

RICHARD M. KLEIN

NUCLEOPROTEINS. R. Stoops, Ed. 364 pages. Interscience Publishers, Inc., New York. 1960. $10.50.

The proceedings of the eleventh Solvay Conference on Chemistry, held in Brussels in June 1959, have been prepared as a book. Ten distinguished biochemists have contributed chapters on various aspects of the chemistry of information bearing macromolecules. Of special interest is a chapter on the synthesis of nucleic acids in cell-free systems by Prof. S. Ochoa—a research project which won him a Nobel Prize last year.

RICHARD M. KLEIN

TREES, SHRUBS AND VINES; Viertel, Arthur T. Without pagination, illustrated, indexed by plant numbers. State University College of Forestry, Syracuse, N. Y. 1960. $1.25.

About six hundred common species of woody plants (exclusive of conifers) native or cultivated in the northeastern United States are illustrated (chiefly the leaves) and described in an artificial sequence based on leaf form. The book is directed to the general public, and technical terminology is held to a minimum.

ARTHUR CRONQUIST

DRAWINGS OF BRITISH PLANTS. PART XIV ADOXACEAE. Ross Craig, Stella. 38 plates, indexed. G. Bell & Sons Ltd. London. 1960. $1.50.

The work consists of a series of accurate, beautifully-done line drawings, with color notes, continuing the high standard of previous parts of the series.

ARTHUR CRONQUIST

THE ANATOMY OF PLANTS. Font Quer, P. 128 Pages. Illustrated, indexed. Harper & Bros., New York, N. Y. 1960. $2.25.

This little book is one of a series entitled "Science Today." It is translated from the Spanish, the author being Professor of Botany at the University of Barcelona. Its six chapters embrace cell structure, histology, and external morphology, besides anatomy proper. It is well illustrated by numerous pen-and-ink drawings. Though apparently designed for general reading, its usefulness will probably be as a text in schools.

H. W. RICKETT

HOUSE PLANTS. Better Homes and Gardens (Editors). 160 pages, illustrated, indexed. Meredith Publishing Co., Des Moines, Iowa. 1959. $2.95.

The simplicity in giving basic information on how to care for house plants, as well as their use to enhance the beauty of different rooms, and the excellent pictures, both colored and black and white, make this truly a book worth having for reference. The introduction given by the Editors of *Better Homes and Gardens* on page 5 is excellent.

MARY F. JOHNSON
Pompton Lakes, New Jersey

Members of The Corporation of The New York Botanical Garden

Mrs. Willcox B. Adsit
Arthur M. Anderson
Mrs. Arthur M. Anderson
W. Earle Andrews
Mrs. Montgomery B. Angell
George Arents, Jr.
Mrs. Elliott Averett
Sherman Baldwin
Mrs. John Holme Ballantine
Mrs. William Felton Barrett
Mrs. John D. Beals, Jr.
Mrs. Neville J. Booker
Mrs. James Cox Brady
Mrs. Richard De W. Brixey
Mrs. Detlev W. Bronk
Dr. Lyndon O. Brown
Leonard J. Buck
Charles Burlingham
Mrs. Charles Burlingham
Mrs. Joseph Campbell
George Champion
Mrs. LeRoy Clark
Dr. Harold H. Clum
Mrs. Leighton H. Coleman
Mrs. Henry S. Fenimore Cooper
Mrs. Erastus Corning II
Mrs. William Redmond Cross
C. Suydam Cutting
Mrs. Sidney G. de Kay
Edward C. Delafield
Mrs. Edward C. Delafield
Mrs. Lyman Delano
Hon. Thomas C. Desmond
Mrs. Fairman R. Dick
Mrs. Charles D. Dickey
Mrs. Charles Doscher
Mrs. Percy L. Douglas
Mrs. Walter Douglas
Henry F. du Pont
Mrs. Walter K. Earle
Mrs. William B. Eddison
Mrs. Robert B. English
Mrs. B. Tappen Fairchild
Mrs. Moses W. Faitoute
Lynn Farnol
Mrs. Reginald Fincke
Dr. John M. Fogg, Jr.
Mrs. Mortimer J. Fox
Childs Frick
Mrs. John W. Galbreath
Berkeley Gaynor
Mrs. John Gerdes
Dr. H. A. Gleason
Mrs. L. Whittington Gorham
Mrs. Raymond M. Gunnison
Mrs. Henry B. Guthrie
Mrs. Sherman P. Haight
Charles B. Harding
Mrs. Montgomery Hare
Mrs. Randolph C. Harrison
Mrs. Roy A. Hunt
William E. Hutton
Mrs. J. Horton Ijams
Mrs. Edwin C. Jameson
Mrs. Alvin R. Jennings
Mrs. Walter Jennings
Prof. Marshall Kay
Dr. Theodore Kazimiroff
Mrs. William Kemble
Mrs. Francis K. Kernan
Dr. Charles G. King
Mrs. Warren Kinney
Mrs. Grayson Kirk
Mrs. Lee Krauss
H. R. Kunhardt
Mrs. Blake L. Lawrence
Mrs. Barent Lefferts
Mrs. Madison H. Lewis
Mrs. John E. Lockwood
Mrs. William A. Lockwood
Mrs. Robert A. Lovett
Mrs. Ethelbert Ide Low
Mrs. James C. Mackenzie
Mrs. Peter Malevsky-Malevitch
Mrs. Clifford D. Mallory
Alastair Martin
Prof. Edwin B. Matzke
Howard W. Maxwell, Jr.
Louis E. McFadden
Rev. L. J. McGinley, S. J.
Mrs. Richard S. Meredith
Miss Elinor Merrell
Mrs. Elmer D. Merrill
Mrs. Clarence G. Michalis
S. P. Miller
Mrs. Harold Ruckman Mixsell
Henry de la Montagne
Gilbert H. Montague
Barrington Moore
F. Cleveland Morgan
B. Y. Morrison
Frederick S. Moseley, Jr.
Mrs. Augustus G. Paine
Henry Parish II
Mrs. John E. Parsons
Mrs. Wheeler H. Peckham
Mrs. Harry T. Peters
Mrs. Thomas McC. Peters
Howard Phipps
Mrs. H. Harvey Pike
Mrs. Hermann G. Place
Rutherford Platt
Prof. Frank J. Pokorny
Mrs. Harold I. Pratt
Mrs. Rodney Procter
Mrs. Charles G. Proffitt
Lady Ramsey
Mrs. S. Bulkley Randolph
Johnston L. Redmond
Mrs. Fergus Reid, Jr.
Mrs. Volney F. Righter
Mrs. David Rockefeller
Mrs. Herman D. Ruhm, Jr.
Mrs. Melvin E. Sawin
John M. Schiff
Mrs. Henry F. Schwartz
Mrs. Townsend Scudder
Mrs. John L. Senior
Mrs. Guthrie Shaw
Langdon S. Simons
Mrs. Langdon S. Simons
Mrs. Clarance Stanley
Dr. William C. Steere
Edgar B. Stern
Mrs. Eugene W. Stetson
Chauncey Stillman
Mrs. Byron Stookey
Mrs. Donald B. Straus
Nathan Straus
Mrs. Paul Sturtevant
Mrs. Arthur H. Sulzberger
Joseph R. Swan
Mrs. Joseph R. Swan
Mrs. Thomas D. Thacher
Oakleigh L. Thorne
John C. Traphagen
Mrs. Ernest G. Vietor
Mrs. Antonie P. Voislawsky
R. Gordon Wasson
Mrs. Thomas J. Watson
Mrs. Charles D. Webster
Mrs. Jerome P. Webster
Nelson M. Wells
Mrs. Arnold Whitridge
Mrs. Wallace S. Whittaker
Mrs. Andrew Murray Williams
Mrs. Earl K. Williams
Mrs. John G. Winchester
Dr. John C. Wister

LETTERS TO EDITOR

After the meeting in mid-August in Knoxville, Tennessee, of the Northern Nut Growers Association, I did some further exploration for *Hydrangea* and other plants in the Southeast. I found *H. arborescens* at elevations of sixty-four hundred and sixty-five hundred feet near the top of Chingman's Dome in the Smoky Mountains (Swain County, North Carolina) which corroborated the collection at six thousand feet on Mt. Mitchell.

Dr. James Hardin, Botanist at North Carolina State College, has recently found a spectacular form of *H. radiata* in Transylvania County, North Carolina, which the University will try to introduce into cultivation. Its ray flowers reach two and a quarter inches in diameter. This species, found along streams in the Blue Ridge in an area including the corner of the Carolinas with Georgia, is like *H. arbore-*

scens in most respects, except that the lower leaf surfaces are silvery pubescent. Elizabeth McClintock (about 1951) called it a subspecies of *H. arborescens*, but Dr. Hardin considers it a valid species.

My father Thomas A. McDaniel filled me in on the history of the (nearly?) all-showy-flowered form of *H. quercifolia* found in Etowah County, Alabama, which I expect to introduce as the cultivar 'Harmony'. (Three nurseries now have cuttings.) When he was twelve years old, around 1893, he found a bush with "snowball" flowers in the woods on the family farm. He transplanted it to the homeyard, where it flourished for some ten years. Then it disappeared, or died out, only to be rediscovered (or one like it) by me early this year in the Old Harmony Churchyard about two miles distant.

Now that greenwood cuttings of *H. quercifolia* can be rooted quickly under mist propagation, this and other superior forms of the oakleaf hydrangea can be made available for general cultivation without waiting too long.

JOSEPH C. MCDANIEL
Department of Horticulture
University of Illinois
Urbana, Illinois

I have just seen my letter to Dr. Rickett about the allusion in Willa Cather's novel about substitution in botany, in *The Garden Journal*.

Much to my shame I have given you the wrong novel. The allusion appears in *The Professor's House* (Book 2, Chapter 1).

I hope this hasn't caused any embarrassment.

JOHN MABCH
Willa Cather Pioneer Memorial
New York, N. Y.

The Editor's "face is red." She should have checked the book title.

I enjoyed Paul Arnold's excellent article in the November-December [1960] issue of *The Garden Journal*. It indicates a lot of research.

Since he obtained information from me, I have successfully backcrossed *Gloxinera* 'Longiflora' with *Sinningia eumorpha*. I raised only one seedling to maturity, but it was intermediate, except that the corolla formation more closely resembled S. *eumorpha* and had a delicate blush-pink coloration. The backcross to *Rechsteineria cardinalis* was also intermediate, but the corolla change from the regular form obtained in the × *Gloxinera* did not approach the *R. cardinalis* helmet shape to as noticeable a degree. In color the range went from light red to orange. Although my observations are based on very limited populations, I am convinced that S. *eumorpha* might be allied with *Rechsteineria*. The original cross produced a regular corolla with a five-part limb, but I believe the pouch and white color of *Eumorpha* will be dominant in future hybridizing.

The × *Gloxinera* appears to be a very willing parent. I have crossed it with *R. leucotricha* to incorporate the tomentose characteristic of the latter with a reduction in flower size of approximately one half.

There are many possibilities for further hybridizing with × *Gloxinera*, and I have quite a few seeds sown.

CORNELIUS ACKERSON
Keyport, New Jersey

PRELIMINARY ANNOUNCEMENT

MEMBERS' EVENING

TUESDAY, FEBRUARY 28, 1961

T. H. Everett, *Program Chairman*

WHERE: Essex House
160 Central Park South
New York City

WHEN: Informal Reception 8:00 o'clock

Formal Program begins 8:15 o'clock promptly

WHAT: "The Broad Function of the Modern Botanical Garden" — An address by Dr. Frits W. Went, Director of the Missouri Botanical Garden

"A Bug's View of Nature" — An outstanding film presentation with comments by its producer, the noted photographer, Mr. H. I. Williams

Refreshments

HOW: All members will receive invitations in late January and will be asked to request one or two tickets by return mail.

Two Winter Courses
At The New York Botanical Garden

Anyone who grows plants soon learns the importance of identifying plant pests and diseases, understanding them, and learning the best control methods known. Dr. P. P. Pirone will be the very able instructor of classes in PLANT PESTS AND DISEASES beginning on January 12, 1961. His teaching and writing serve as valuable guides to American horticulturists, and his up-to-date recommendations for dealing with pathological problems are always in demand.

This course consists of twelve Thursday sessions, with choice of morning classes (10-noon), or evening classes (8-9). Classes will be held in the seminar room of the Research Laboratory at The New York Botanical Garden. The registration fee is $15.00, with a special price of $11.25 for members of The Garden.

PLANNING THE HOME GROUNDS offers a very unusual opportunity to learn the fundamentals of landscape design, and how to proceed in making the most of one's own property. The instructor will be Arthur Murphy, a landscape architect of broad experience who is particularly well qualified to suggest solutions to the homeowners' landscape problems. Rightly, he begins by assisting students to map their own property, and proceeds by giving individual attention to the working-out of a practical plan for either new planting or improving one which is already established.

For this popular course, advance registration is requested. The course, beginning on January 17, 1961, is scheduled for eight Thursdays (10:30 a.m.-12:30 p.m. or 8-10 p.m.) in the seminar room of the Research Laboratory. The regular registration fee is $25.00—but only $18.75 for members.

THE NEW YORK BOTANICAL GARDEN
Bronx Park, New York 58, N. Y. (Phone LU 4-8500)

Emergency treatment for a stricken tree

Trees also can go into a "state of shock" as a result of severe defoliation, drought, roots cut during construction and soil compaction. When conditions are critical and normal methods of feeding will not suffice, a more forceful and immediate assimilation of nutritive stimulants is essential. Bartlett Tree Experts, when faced with this situation employ a scientific "shock treatment" which stimulates circulation from the roots to the very crown. If the tree responds, the results are apparent within a few hours in a notably improved color of leaves. The effects of this emergency treatment are temporary, but it conditions the tree to function normally and when followed by scientific feeding usually results in complete recovery. The ability to diagnose difficult situations plus the knowledge and equipment to cope with them is the reason why more and more people turn to the Bartlett Way—The Scientific Way to protect their trees. Call your local Bartlett Tree Expert for an analysis of your trees today.

The Bartlett Way

BARTLETT TREE EXPERTS

Home Office, Research Laboratories and Experimental Grounds, Bartlett School of Tree Surgery, Stamford, Conn.

Local Offices from Maine to Florida, and West to Illinois and Alabama.

See your Local Telephone Directory for Local Address.